# CODE ANALYSIS

## APPLICABLE CODES

| | Year | | Year |
|---|---|---|---|
| International Building Code | 2006 | National Electrical Code | 2005 |
| International Mechanical Code | 2006 | Uniform Code for | |
| International Plumbing Code | 2006 | Building Conservation | |
| International Fire Code | | ADA Accessibility | |
| International Energy Conservation Code | | Guildelines | |

A. Occupancy and Group: EXISTING CENTRAL HEATING PLANT

Change in Use: Yes _____ No X Mixed Occupancy: Yes X No _____

Special Use and Occupancy (e.g. High Rise, Covered Mall): CENTRAL HEATING PLANT

B. Seismic Design Category: 1 Design Wind Speed: N/A mph

* Central Plant has Under Gone a Seismic Report. See WSU Report.

C. Type of Construction (circle one): EXISTING CENTRAL HEATING PLANT

I A | I B | II A | II B | III A | III B | IV HT | V A | V B

D. Fire Resistance Rating Requirements for the Exterior Walls based on the fire separation distance (in hours): N/A

North: EXIST. South: EXIST. East: EXIST. West: EXIST.

E. Mixed Occupancies: N/A Nonseparated Uses: N/A

F: Sprinklers:

Required: NO Provided: NO Type of Sprinkler System: N/A

G: Number of Stories: TWO Building Height: 32' BASEMENT - FIRST FLOOR

H: Actual Area per Floor (square feet): LOWER FLOOR - 5400 SQ. Ft. UPPER FLOOR - 1326 SQ. Ft.

I: Tabular Area: N/A

J: Area Modifications: NONE

a) $A_a = A_t + \left[\frac{A_t I_f}{100}\right] + \left[\frac{A_t I_s}{100}\right]$ $\quad I_f = 100\left[\frac{F}{P} - 0.25\right]\frac{W}{30}$

b) Sum of the Ratio Calculations for Mixed Occupancies:

$\frac{\text{Actual Area}}{\text{Allowable Area}} \leq 1$

c) Total Allowable Area for:

1) One Story: _____
2) Two Story: $A_a(2)$_____
3) Three Story: $A_a(3)$_____

d) Unlimited Area Building: Yes _____ No _____ Code Section: _____

K. Fire Resistance Rating Requirements for Building Elements (hours). N/A

| Element | Hours | Assembly Listing | Element | Hours | Assembly Listing |
|---|---|---|---|---|---|
| Exterior Bearing Walls | | | Floors - Ceiling Floors | | |
| Interior Bearing Walls | | | Roofs - Ceiling Roofs | | |
| Exterior Non-Bearing Walls | | | Exterior Doors and Windows | | |
| Structural Frame | | | Shaft Enclosures | | |
| Partitions - Permanent | | | Fire Walls | | |
| Fire Barriers | | | Fire Partitions | | |
| | | | Smoke Partitions | | |

L. Design Occupant Load: FLUCTUATES-BETWEEN ONE TO SIX

Exit Width Required: _____ Exit Width Provided: 21 L.F. - 5 EXITS
EXISTING LOWER LEVEL-3 EXITS
EXISTING UPPER LEVEL-2 EXITS

M. Minimum Number of Required Plumbing Facilities: 3 EXISTING TOILET ROOMS
Two lower level and one upper level and one breakroom. All are unisex facilities.

a) Water Closets - Required (m) _____ (f) _____ Provided (m) 3 (f) _____
b) Lavatories - Required (m) _____ (f) _____ Provided (m) 3 (f) _____
c) Bath Tubs or (Showers) 2
d) Drinking Fountains: 2 Service Sinks: 2
e) Urinals: 1 Provided: 1

FOOTNOTES:

1) In case of conflict with the U.S. Department of Justice Federal Registers Parts I through V - ADA Guidelines and specific reference to the International Building Code Accessibility Chapters, the more restrictive requirement shall govern.

2) Additional Code Information shall be provided at the discretion of the Building Official for Complex Buildings. Including, but not limited to:

a) High Rise Requirements.
b) Atriums.
c) Performance Based Criteria.
d) Means or Egress Analysis.
e) Fire Assembly Locator Sheet.
f) Exterior and Interior Accessibility Route.
g) Fire Stopping, Including Tested Design Number.

*WORKSHOP IS EQUIPPED WITH A CABINET MOUNTED STAINLESS STEEL SINK AND EMERGENCY EYE - WASH AND SHOWER.

# WEBER STATE UNIVERSITY
# HEATING PLANT - BOILER REPLACEMENT

## DFCM PROJECT NO. #07049810
## OGDEN CITY, UTAH

State of Utah—Department of Administrative Services

**DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT**

4110 State Office Building / Salt Lake City, Utah 84114 / 538-3018

## DRAWING INDEX:





**WHW ENGINEERING INC.**
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

MECHANICAL ENGINEERS
WHW ENGINEERING, INC.
8619 SANDY PARKWAY
SUITE 101
SANDY, UTAH 84070
PHONE: (801) 466-4021 FAX: (801) 466-8536

STRUCTURAL ENGINEERS
REAVELEY ENGINEERS
675 E. 500 SO.
SUITE 400
SALT LAKE CITY, UTAH 84102
PHONE: (801) 486-3883 FAX: (801) 485-0911

ELECTRICAL ENGINEERS
ECE ELECTRICAL CONSULTING
939 SO. WEST TEMPLE
SALT LAKE CITY, UTAH 84101
PHONE: (801) 521-8007 FAX: (801) 521-8057


PROFESSIONAL ENGINEER
04/11/08
WINWARD M. PACKER
No. 375080
STATE OF UTAH

## I. Design Criteria

A. Governing Building Code: 2006 International Building Code (IBC)

B. Roof Live Loading:
1. Roof Live Load: ..... 20 psf
2. Roof Snow Load: ..... 30 psf + Drift per IBC
   a. Ground Snow Load, $P_g$: ..... 43 psf
   b. Snow Exposure Factor, $C_e$: ..... 1.0
   c. Importance Factor, $I_s$: ..... 1.0
   d. Thermal Factor, $C_t$: ..... 1.0

C. Earthquake:
1. Occupancy Category: ..... I
2. Seismic Design Category ..... D
3. Spectral Response Accelerations:
   $S_s$ = _____ g  $S_{DS}$ = 0.57 g
   $S_1$ = _____ g  $S_{D1}$ = _____ g
4. Soil Site Class: ..... D
5. Basic Seismic-Force-Resisting System: ..... Non-Structural component
   $R_p$ = 2.5  $a_p$ = 1.0
6. Importance Factor, $I_p$ ..... 1.0
7. Design Base Shear Biolar: ..... 10 kips
8. Analysis Procedure: ..... Equivalent Lateral Force (Static)

D. Wind: (Existing Building)

E. Foundation:
1. Subsurface Conditions:
   Soils report and log of borings was obtained by the Owner for the Engineer's use in the design of the foundation, and is not a part of the Contract Documents. This report and log of borings is available for the Contractor's information, but is not a warranty of the subsurface conditions. The Contractor may use the report at his own risk.
2. Soils Report by No soils report – bearing pressures are light.

F. Classification for Fire Rated Construction:
1. For the purpose of determining fire-resistive assemblies, open-web steel framing members shall be considered unrestrained. All other steel floor and roof framing members shall be considered restrained.
2. Diagonal members in vertical braced frames shall be considered as secondary members for fire proofing protection.

## II. Earthwork

A. Clearing: The entire footing area shall be cleared of all existing structures, footings, and other debris.

B. Remove all loose material from below footings and replace it with compacted structural fill. Provide a minimum of 12" of compacted structural fill below the footing.

C. Proof rolling: The natural undisturbed soil below all footings shall be proof rolled prior to placing concrete. Remove all soft spots and replace with compacted structural fill.

D. Compacted structural fill: All fill material shall be a well-graded granular material with a maximum size less than 4 inches and with not more than 10 percent passing a No. 200 sieve. It shall be compacted to 95 percent of the maximum laboratory density as determined by ASTM D1557. All fill shall be tested (See Specifications and the Quality Assurance section of the GSN).

## III. Concrete

A. Materials shall comply with the Standards specified in American Concrete Institute (ACI) 318-05, "Building Code Requirements for Structural Concrete."
1. Compressive strengths of concrete at 28 days shall be as follows:
   a. Footings: ..... 3000 psi
   b. Slabs on Grade: ..... 3000 psi
   c. All other Site Cast Concrete: ..... 4000 psi
2. Concrete Density (Maximum Air Dry Weight):
   a. Normal weight concrete shall be approximately 145 to 155 pounds per cubic foot.
   b. Lightweight concrete shall not exceed 110 pounds per cubic foot and shall be made of lightweight coarse aggregates and a blend of lightweight and normal weight fines.
3. Reinforcement steel:
   a. ASTM A615 Grade 60, fy = 60,000 psi min. unless noted otherwise.
   b. Reinforcement at concrete moment frames and shear wall jambs shall be ASTM A706 or ASTM A615 Grade 60, with the following properties:
      (1) Actual yield strength based on mill tests shall not exceed 78,000 psi.
      (2) Retest shall not exceed 91,000 psi.
      (3) Ratio of actual ultimate tensile stress to the actual yield strength shall not be less than 1.25.
      (4) Mill tests shall be submitted to the Engineer.
4. Admixtures:
   a. Air-entraining admixtures, comply with ASTM C 260 (when used).
      (1) When air content of a trowel finished floor slab exceeds 3%, there is an increased risk for delaminations and blistering to occur. When this situation is present, the contractor shall pay special attention to the finishing procedures to help minimize such risks. Refer to ACI 302.1R-96 "Guide for Concrete Floor and Slab Construction" for proper finishing guidelines.
   b. Calcium chloride shall not be added to the concrete mix.
5. Only one grade or type of concrete shall be poured on the site at any given time.
6. Plastic coated tie wires and chairs shall be used to support reinforcing bars, tie bars and tendons.

B. Formwork shall comply with ACI Standards Publication 347 and the project specifications. The contractor shall be responsible for the design, detailing, care, placement and removal of the formwork and shores.

C. Concrete cover requirements for deformed bar reinforcing steel shall comply with ACI 318, "Building Code Requirements for Structural Concrete".

| | Clear Cover |
|---|---|
| 1. Cast-in-place Concrete: | |
| a. Cast against and permanently exposed to earth: | 3" |
| b. Formed concrete exposed to earth or weather: | |
| #6 thru #18 bars | 2" |
| #5 and smaller bars | 1 1/2" |
| c. Concrete not exposed to weather or in contact with ground: | |
| Slabs, Walls, Joists, #11 bars and smaller | 3/4" |
| Beams, Columns: Primary Reinf., Ties, Stirrups, Spirals | 1 1/2" |
| d. Concrete Tilt-Up Panels: | |
| #6 and smaller bars | 1" |
| #9 thru #18 bars | 2" |
| 2. Pre-cast Concrete (manufactured under plant controlled conditions): | |
| a. Wall Panels #11 bars and smaller | 3/4" |
| b. Other members #6 thru #11 bars | 1 1/2" |
| c. Other members #5 bars and smaller | 1 1/4" |
| 3. Prestressed Concrete (Provide the following minimum cover for prestressed and non-prestressed reinforcements, ducts, and end fittings.): | |
| a. Cast against and permanently exposed to earth | 3" |
| b. Formed concrete exposed to earth or weather: | |
| Wall Panels, Slabs, Joists | 1" |
| Other members | 1 1/2" |
| c. Concrete not exposed to weather or in contact with ground: | |
| Slabs, Walls, Joists | 3/4" |
| Beams, Columns: Primary Reinf | 1 1/2" |
| Ties, Stirrups, Spirals | 1" |

D. Construction Joints and Control Joints:
1. Provide a continuous 2 X 4 keyway or a surface intentionally roughened to a full amplitude of approximately ¼" in all wall footings. Adjust the keyway as necessary to provide for proper bar placement. A continuous keyway shall not be used for concrete shear wall to footing connections, unless specifically indicated. Refer to project plans, schedules and details for the shear wall to footing connection requirements.
2. All horizontal and vertical construction joints shall have a continuous 2 X 4 keyway along the joint or joints shall be intentionally roughened to a full amplitude of approximately ¼", unless noted otherwise.
3. Provide reinforcement dowels to match the member reinforcement across the joint except for shear walls, unless noted otherwise. For dowels across construction joints and wall to footing connections of concrete shear walls, refer to specific project plans, schedules, and details.
4. Construction joints in suspended concrete pours shall be made at the center of spans.
5. Slabs on grade shall have construction or control joints spaced not to exceed 30 times the slab thickness in any direction. All discontinuous control or construction joints shall be reinforced with 2 - #4 x 48". See structural details. Construction joints shall not exceed a distance of 125'-0" o.c. in any direction.
6. Control joints shall be installed in slabs on grade so the length to width ratio of the slab is no more than 1.25:1. Control joints shall be completed within 12 hours of concrete placement. Control joints may be installed by:
   a. Saw cut a depth of 1/4 the thickness of the slab
   b. Tooled joints a depth of 1/4 the thickness of the slab
7. Control joints in visually exposed walls, unless noted otherwise: (Joints shall line up with masonry and architectural joints, see drawings.)
   a. Vertical control joints at 10'-0" on center.
   b. Reinforcing shall be continuous through control and construction joints, unless noted otherwise.
   c. Control joints in concrete foundation walls shall line up with masonry control joints.
8. Control joints shall be installed in suspended slabs over steel decking by sawcutting along all interior grid lines. Joints centered above the purlins shall be ¾" deep and shall have #4 X 5'-0" at 16" o.c. reinforcing, placed perpendicular (and centered) to the purlin. Joints centered above the girders shall be ¾" deep and shall have #4 X 10'-0" at 16" o.c. reinforcing placed perpendicular (and centered) to the girder. The #4 bar reinforcing centered above the grid lines is in addition to the specified WWF continuous throughout the suspended slabs over steel decking. Reinforcing shall be placed 1" below the top of the slab.

E. Detailing: All reinforcing, including WWF, shall be detailed, bolstered & supported to comply with ACI 315, "Details and Detailing of Concrete Reinforcement" and the Concrete Reinforcing Steel Institute (CRSI) recommendations. Reinforcing bars shall not be welded unless specifically shown on drawings.
1. Lap splice lengths shall be detailed to comply with the "Reinforcing Bar Lap Splice Schedule" contained within the contract drawings. Splices may be made with mechanical splices capable of 125% tension capacity of the bar being spliced. Mechanical splices shall be the positive connecting type coupler. They shall be covered by a current ICC Code Evaluation Report. Use "Cadweld" splice sleeves with ferrous filler, "Lenton" taper threaded rebar splices, "Bar-Lock" lockshear bolt coupling sleeves, or approved equivalent. If mechanical splices are used, splices or couplers on adjacent bars shall be staggered a minimum of 24" apart along the longitudinal axis of the reinforcing bars.
2. All embedments and dowels shall be securely tied to formwork or to adjacent reinforcing prior to the placement of concrete.
3. Use chairs or other support devices recommended by the CRSI to support and tie reinforcement bars and WWF prior to placing concrete. WWF shall be continuously supported at 36" o.c. maximum.
4. Contractor shall coordinate placement of all openings, curbs, dowels, sleeves, conduits, bolts, inserts and other embedded items prior to concrete placement.
5. All reinforcement shall be bent cold, and shall be bent only once at the same location. All reinforcement shall be shop bent, unless otherwise permitted by the engineer.

## IV. Structural Steel

A. Material:
1. W-Shapes: ASTM A992, ($F_y$ = 50 ksi), except as noted otherwise.
2. All Other Shapes and Plates: ASTM A36 (Fy = 36 ksi), except as noted otherwise.
3. Rectangular and Square Hollow Structural Sections (HSS): ASTM A500, Grade B (Fy = 46 ksi).
4. Round HSS: ASTM A500, Grade B (Fy = 42 ksi).
5. Steel Pipe: ASTM A53, Grade B (Fy = 35 ksi).
6. Deformed Bar Anchors (DBA): ASTM A496.
7. Headed Stud Anchors (HSA): ASTM A108, with dimensions complying with AISC specifications.
8. Anchor Rods: ASTM F1554, Grade 36 with ASTM A563 heavy hex nuts and ASTM F436 hardened washers, unless noted otherwise.
9. All steel shapes and plates which are a part of the seismic force resisting system shall have Charpy V-Notch absorbed energy of 20 ft-lbs. or greater at 70 degrees Fahrenheit, as indicated below:
   a. Shapes: Group 3 (with flanges 1.1/2" or thicker), Groups 4 and 5.
   b. Plates: 2" and thicker.
   c. Test Frequency: Each heat.

B. Fabrication and construction shall comply with the following Codes and Standards:
1. American Institute of Steel Construction (AISC) 360-05, "Specification for Structural Steel Buildings," dated March 9, 2005.
2. AISC 341-05, "Seismic Provisions for Structural Steel Buildings" dated March 9, 2005, including Supplement No. 1, dated November 16, 2005.
3. AISC 303-05, "Code of Standard Practice for Steel Buildings and Bridges" excluding the following: Section 3.3 (last sentence of first paragraph), Section 4.4, Section 4.4.1, Section 4.4.2, Section 4.5, and Section 7.13.3.
   a. The architectural drawings are the prime contract drawings. Consultants' drawings by other disciplines are supplementary to the architectural drawings. The structural drawings shall be used in conjunction with the architectural drawings. Detailing and shop drawing production for structural elements will require information (including dimensions) contained in architectural, structural, and/or other consultants' drawings. Refer to VII. Special Instructions, notes VII.B and VII.C on this sheet.
4. AISC 358-05, "Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications," dated December 13, 2005.
5. AISC/RCSC 2004, "Specification for Structural Joints Using ASTM A325 or A490 Bolts"
6. American Welding Society (AWS) D1.1-04, "Structural Welding Code – Steel" (specific items do not apply when they conflict with the AISC requirements).
7. Steel Joist Institute (SJI) 1994, "Standard Specification, Load Tables and Weight Tables for Steel Joists and Joist Girders," and "Recommended Code of Standard Practice."
8. American Iron and Steel Institute (AISI) 2001, "North American Specification for the Design of Cold-Formed Steel Structural Members."

C. Structural shapes and plates shall be fabricated from newly rolled (milled) one-piece sections without splices, unless specifically noted otherwise on the structural drawings. Connections for structural steel shall comply with the structural drawings, unless written approval is given by the structural engineer.

D. Welding:
1. Certification of Welders: All shop and field welding shall be executed by AWS certified welders who have been specifically certified for the type of work to be performed. Certification shall be considered current if dated within the past 12 months. Welders will be considered certified if they have been certified under AWS and their work records are current within every six-month period thereafter as required by AWS. Certification and records must comply with AWS Standards. Certification and appropriate records must be provided to the architect prior to beginning work.
2. Electrodes: E-70 XX or as noted otherwise. E60 XX may be used for welding steel floor and roof decks.
3. Minimum Welds: All intersecting steel shapes that are not bolted shall be connected by a fillet weld all around, unless noted otherwise. Fillet weld sizes that are not shown shall be 1/16" less than the thinnest of the connected parts for thicknesses 1/4" and larger. Fillet welds on plates less than 1/4" shall be of the same size as the thinnest of the connected parts.
4. Reinforcing Bars: Do not weld rebar except as specifically detailed in the drawings. In such cases, use only AWS standards. Do not substitute reinforcing bars for deformed bar anchors (DBAs), machine bolts, or headed stud anchors (HSAs).
5. Bolts: Do not apply any welds, including "tack" welds to bolts, including anchor bolts, except as specifically detailed in the drawings.
6. It is recommended the steel erection contractor and steel fabricator contact the Quality Assurance Agency prior to beginning any of the above welds. A program of joint preparation and welding procedures should be worked out between the two parties before the welding is started so that correct welds will be made from the beginning.
7. Headed Stud Anchor (HSA) welding and Deformed Bar Anchor (DBA) welding shall conform to the manufacturer's specifications. Welding shall comply with AWS D1.1 Section 7.6 through 7.8 and Annex IX.

E. Bolted Connections:
1. Use ASTM A325N bolts for steel to steel connections, as noted herein or as noted on the drawings. A325N bolts shall be used in connections for simple span framing and beam (or girder) to bearing plate connections. Tighten bolts to a snug tight condition. A snug tight condition is usually attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench. Bolts shall be tightened until all plies of the joint are in firm contact.
2. Use ASTM A325N bolts for all steel to steel connections, unless noted otherwise. Tighten bolts by the turn of the nut, calibrated wrench, or direct tension indicator method. Alternate fastener designs as defined by AISC shall be submitted to the engineer for review and acceptability prior to installation. Provide hardened washers beneath turned element.
3. Use ASTM A325X bolts for all steel to steel connections, unless noted otherwise. Tighten bolts by the turn of the nut, calibrated wrench, or direct tension indicator method. Alternate fastener designs as defined by AISC shall be submitted to the engineer for review and acceptability prior to installation. Provide hardened washers beneath turned element.
4. Use ASTM A325SC bolts for all steel to steel connections in moment frames and connections subject to vibrations, unless noted otherwise. Tighten bolts by the turn of the nut, calibrated wrench, or direct tension indicator method. Alternate fastener designs as defined by AISC shall be submitted to the engineer for review and acceptability prior to installation.
5. Provide hardened washers beneath the turned element of all bolts or nuts. Provide hardened beveled washers, to compensate for the lack of parallelism, where the outer face of the bolted parts has a slope greater than one in twenty with respect to the plane normal to the bolt axis. Hardened washers or plates installed over oversized holes or slotted holes shall be at least 5/16" thick and shall conform to ASTM F436. Plates or bars installed at slotted holes shall have a size sufficient to completely cover the slot after installation.
6. Where a steel to steel beam connection is not detailed in the drawings, provide a standard AISC framed connection with the capacity to support one half of the total uniform load capacity of the given shape for the span and for the steel specified.
7. Bolts, nuts and washers shall not be reused.

F. Open Web Steel Joists and Girders:
1. The steel joist supplier shall be responsible for the design of all open web steel joists and girders. Joists or girders with slopes greater than 1/2 inch per foot shall be designed to meet or exceed the load capacities, listed in the SJI load tables, of the joist or girder sizes indicated on the framing plan, as if the joists or girders were installed level.
2. Open web joists and girders shall be designed with deflection limits of L/240 for total load and L/360 for live load, where L is the joist span.
3. Where uplift loads due to wind are indicated, rows of bottom chord bridging shall be provided at the first bottom chord panel points per SJI Specifications. This is in addition to the bridging shown on the framing plans.
4. Provide special bearing ends to accommodate slopes from sloped joists, sloped girders or sloped bearing conditions.
5. Camber. All joists shall be cambered as specified in the SJI specifications, unless noted otherwise.
6. Field Modifications: Do not modify any joist or girder, including holes through the top and bottom chords, without the written consent and direction from the manufacturer.
7. Shop Drawings and Design Calculations: Shop drawings for all joists and girders used in the project shall be submitted for review. Prior to the fabrication of joists and girders, the open web steel joist and girder manufacturer shall prepare complete joist and girder calculations under the direct supervision of a professional engineer licensed in the State of Utah. Calculations shall be submitted for review for joists and girders designated as SPECIAL or SP and for all joists or girders with axial loads or additional concentrated loads (as noted on the drawings). Submitted calculations shall bear the seal of a professional engineer licensed in the State of Utah.
8. Stabilizer Plates: Provide steel joist and joist girder stabilizer plates as indicated. Stabilizer plates shall be 6" x 6" with a 13/16" diameter hole with 1 1/2" minimum edge distance, and shall extend 3" minimum below the bottom chord of the joist or girder. Plate thickness shall be equal to the chord gap minus 1/4", or 3/4", whichever is less.
9. Verify size, weight, location and configuration of all roof top equipment with architect and mechanical engineer. Provide steel frames for support of roof top equipment as indicated on structural details in the structural drawings. Coordinate openings with the mechanical and general contractor.
10. All concentrated loads greater than 100 pounds supported by open web steel joists and girders shall be located within 6 inches of joist or girder panel points or the joist or girder shall be reinforced with an additional web member. Refer to the "TYPICAL DETAIL AT ADDITIONAL CONCENTRATED POINT LOAD" in the structural drawings.
11. Concentrated point loads, single or multiple, totaling 100 pounds or less can be located at any point along the top or bottom chord of an open web steel joist or girder between adjacent panel points without meeting the requirements above. A limit of four concentrated 100# maximum point loads per joist or girder will be permitted on spans of 12' or greater, one concentrated 100# max. load on spans less than 12', unless specifically noted otherwise on the structural drawings.
12. Joist bridging shall never be used to support hanging loads.
13. Bracing of miscellaneous items (mechanical, electrical, plumbing, etc.) to the bottom chord of joists or girders will not be allowed in any instance. All lateral braces must connect to the top flange/top chord of the framing member above unless noted otherwise on the structural drawings.

G. Steel Roof Deck:
1. Steel roof deck shall comply with the latest requirements of the Steel Deck Institute (SDI). Submit ICC Code Evaluation Report with load and lateral shear capacities with shop drawings.
2. Steel roof deck shall be 1 1/2" deep X 20 Gauge minimum galvanized (G60), type "B" wide rib deck with interlocking side seams with the following properties:

| | 20 Gauge |
|---|---|
| Minimum S ($in^3/ft$)= | 0.234 |
| Minimum I ($in^4/ft$)= | 0.213 |

   Painted roof deck shall be coated with special paint to receive sprayed-on fire proofing, where required.
3. Minimum allowable deck diaphragm shear values shall be 543 lb/ft. for a 6 ft. deck span.
4. Weld steel roof deck to supporting framing members with 3/4" diameter puddle welds at the following spacings (Closer spacings may be used to develop minimum shear requirements.):
   a. 6" o.c. to all supports perpendicular to deck corrugations (7 welds per 36" sheet).
   b. 6" o.c. to the following supports parallel to deck corrugations: All perimeter supports, all concrete or masonry walls, all joists or joist girders with a "T/C" designation, and all steel beams which are on a grid line with braced frames or moment frames.
   c. 12" o.c. to all other supports parallel to deck corrugations.
   d. All welded surfaces shall be dry before welding deck to supports.
5. Attach interlocking seams with 1 1/2" long top seam welds at 12" o.c. minimum between adjacent pieces of decking. Crimp side seams before welding. Closer spacings may be used to develop minimum shear requirements.
6. Alternate means of deck attachment and fastening using screws, pins or other mechanical fastening methods are permitted with approval of the engineer. The contractor shall submit the proposed attachment system and the code evaluation report demonstrating the system has the strength to meet the required deck shears specified above (in item 3) and on the plans. The flexibility factor of the proposed deck attachment system shall be equal to or less than the flexibility factor for the specified welded deck attachment system. If the alternate attachment method is approved, it is the responsibility of the contractor to ensure that the deck type and profile is compatible with the fastening system being used.
7. Provide a 2" minimum bearing and a 4-inch lap at the splice points of all pieces of deck.
8. All deck shall be 3-span continuous minimum where possible. The contractor shall provide heavier gauge deck as required for one or two span conditions to meet equivalent loading of the above deck under a three span condition.
9. Steel roof deck shall not be used to support loads from plumbing, HVAC ducts, light fixtures, architectural elements or equipment of any kind, unless specifically noted otherwise. Lightweight suspended acoustical ceilings with a total weight per wire not exceeding 50# may be hung from the steel roof deck. The hangers should be staggered to distribute the load over multiple deck flutes.

SHEET NOTES


State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us


CONSULTANTS


WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

REAVELEY ENGINEERS + ASSOCIATES
Consulting Structural Engineers
675 E. 500 S. Suite 400
Salt Lake City, UT 84102
P:801.486.3883
F:801.485.0911
www.reaveley.com


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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| | | |

PROJECT MANAGER: APB
DRAWN BY: CAT/REA
CHECKED BY: OWW
DATE: 4/11/08
WHW JOB NO.: 07037

LICENSED CERTIFIED STRUCTURAL ENGINEER
NO. 154201
ARTHUR PARRY BROWN
UTAH

SHEET TITLE
**GENERAL STRUCTURAL NOTES**

SHEET NO.
**SE001**

## V. Special Instructions

A. The project specifications are not superseded by the General Structural Notes but are intended to be complementary to them. Consult the specifications for additional requirements in each section. Notes and specific details on the drawings shall take precedence over General Structural Notes and typical details.

B. The architectural drawings are the prime contract drawings. Consultant drawings by other disciplines are supplementary to the architectural drawings. All omissions or conflicts, including dimensions, between the various elements of the consultants' drawings and/or specifications shall be brought to the attention of the Architect before proceeding with any work involved. In case of conflict, follow the most stringent requirement as directed by the Architect without additional cost to the owner. Any work done by the contractor after discovery of such discrepancy shall be done at the contractor's risk.

C. The structural drawings shall be used in conjunction with the architectural drawings. Primary structural elements and overall structural layout are indicated within the structural plans and details. Some secondary elements, architectural layouts, alcoves, elevations, slopes, depressions, curbs, mechanical equipment and electrical equipment, are not indicated within the structural drawings. Detailing and shop drawing production for structural elements will require information (including dimensions) contained in the architectural, structural and/or other consultants' drawings.

D. Shoring and Bracing Requirements:
1. Floor and Roof Structures -- The General Contractor is responsible for the method and sequence of all structural erection. He shall provide temporary shoring and bracing as his method of erection requires to provide adequate vertical and lateral support. Shoring and bracing shall remain in place as the chosen method requires until all permanent members are in place and all final connections are completed, including all roof and floor attachments. The building shall not be considered stable until all connections are complete.
2. Foundation walls must be braced until the complete floor or roof systems is completed. Do not backfill until floor or roof systems are in place.
3. Walls above grade shall be braced until the structural system is complete. Walls shall not be considered to be self supporting.

E. All expansion joints (E.J.) shown in the structural drawings shall be considered seismic separation joints, unless noted otherwise.

F. Submittals: A copy of all shop drawings that have been submitted for review must be kept at the construction site for reference. These drawings must bear the appropriate review stamps. The shop drawing review shall not relieve the contractor of the responsibility of completing the project according to the contract documents. The general contractor shall review and mark all shop drawings prior to submitting them to the Architect for his review. Shop Drawings made from reproductions of (these) contract drawings will be rejected.

G. Project Coordination: It shall be the responsibility of the general contractor to coordinate with all trades any and all items that are to be integrated into the structural system. Openings or penetrations through, or attachments to the structural system that are not indicated on these drawings shall be the responsibility of the general contractor and shall be coordinated with the Architect/Engineers. The order of construction is the responsibility of the general contractor. It is the contractor's obligation to provide all items necessary for his chosen procedure.

H. Contractor shall field verify all dimensions, and conditions. If the contract drawings do not represent actual conditions, contractor shall notify architect/engineer prior to fabrication or construction within that area.

I. Notice of Copyright: The structural drawings, plans, schedules, notes and details are hereby copyrighted by Reaveley Engineers and Associates, Inc., All Rights reserved. Submission or distribution of documents to meet official regulatory requirements or for similar purposes in connection with the project is not to be construed as publication in derogation of Reaveley Engineers & Associates, Inc.'s reserved rights. The documents defining the structure are instruments of service prepared by Reaveley Engineers and Associates, Inc. for one use only. Furthermore, these documents shall not be reproduced, or copied, in whole or in part by the contractor or his subcontractors for preparation of shop drawings or other submittals.

## VI. Quality Assurance

A. Quality Assurance Agency Requirements:
1. The owner shall engage a qualified Quality Assurance Agency (QAA) to provide all special inspection and quality assurance testing for the project. All quality assurance personnel assigned to the project shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.
2. Prior to construction, the QAA shall prepare a written Quality Assurance Implementation Plan (QAIP) for the project. The QAIP shall include a list of personnel assigned to the project including management personnel, inspection procedures and frequency, proposed testing methods and frequency of testing, and reporting procedures. The QAIP shall also outline methods of documenting deficiencies and reporting corrections. A copy of the QAIP shall be given to the contractor for review and coordination with subcontractors.
3. Prior to construction, the QAA shall submit the following information to the Architect and Engineer of Record for approval:
   a. A copy of the Quality Assurance Implementation Plan for the project.
   b. A copy of the appropriate certification and training records for each individual performing inspections or testing.
   c. A list of the testing equipment designated for the project and recent calibration records for the equipment.
   d. Sample inspection and testing reports and the distribution list for the reports.
4. The special inspector shall inspect the work per Chapter 17 of the IBC for conformance with the contract documents. The special inspector shall send reports to the owner, building official, architect, engineer, and contractor. All discrepancies shall be brought to the immediate attention of the contractor for correction. The QAA shall submit a final signed report stating that the special inspection work was, to the best of their knowledge, in conformance with the plans, specifications and applicable workmanship provisions of the IBC.

B. Seismic Force Resisting Systems
1. Elements that are a part of the Main Seismic Force Resisting System for the structure may require increased quality assurance inspection and testing. The Main Seismic Force Resisting system for the structure includes the following elements:
   a. Roof decking.
   b. All elements labeled as "drag struts" or "chords."
   c. Connections between the elements referenced above.

C. Special Inspection: Special Inspection shall be provided for the following elements per IBC sections 1704 and 1707:
1. Concrete and elements embedded in concrete shall be special inspected prior to and during placement of concrete. Special inspection of concrete shall include the following:
   a. Reinforcing steel size and placement.
   b. Surface preparation at cold joints including placement of keyways.
   c. Bolt and embed size, configuration and placement.
   d. Concrete shall receive continuous special inspection during placement, and periodic inspection after placement to ensure proper curing and weather protection procedures.
2. Structural steel fabrication and erection shall be special inspected, including the following:
   a. High strength bolts per IBC 1704.3.3 and IBC section 2209.
   b. Fillet welds smaller than 5/16" per AWS D1.1.
   c. Fillet welds larger than 5/16", multiple pass welds, and all groove welds shall receive continuous special inspection during weld placement per AWS D1.1.
   d. Welding of reinforcing steel shall receive continuous special inspection during weld placement per AWS D1.1.
   e. Welding of Headed Stud Anchors (HSA) and Deformed Bar Anchors (DBA) shall be inspected to comply with AWS D1.1 Section 7.6 through 7.8 and Annex IX.
   f. Welding or fastening of floor or roof deck per AWS D1.3, or per the code evaluation report for the fastening method.
   g. Welding primary members of moment frames shall receive continuous special inspection to comply with AWS D1.1 and AISC 358, and the special provisions for moment frames in the structural steel sections of the GSN and specifications.
3. Post-installed anchors, including but not limited to expansion anchors, adhesive anchors and rebar dowels, and low velocity fasteners, shall receive special inspection per the code evaluation reports for the anchors.
   a. Continuous special inspection is required during the installation of all adhesive anchors and rebar dowels. Special inspector shall verify the following:
      (1) Anchor size and steel grade.
      (2) Hole diameter, location, and type of drill bit.
      (3) Cleanliness of hole and anchor.
      (4) Adhesive application.
      (5) Anchor embedment.

D. Structural Testing: The following materials shall be tested per IBC sections 1704 and 1708. The owner reserves the right to test any and all materials using any appropriate non-destructive procedure. Any items found to be deficient shall be corrected and retested at no additional cost to the owner.
1. Earthwork: All compacted structural fill shall be tested to verify soil gradation, lift thickness, and compaction requirements. See the specifications and earthwork section of the GSN for testing frequency and acceptability criteria.
2. Concrete Strength Verification and Testing. All concrete shall be tested to verify strength, slump, unit weight, air content, and temperature. See the specifications for testing criteria, testing frequency and acceptability criteria.
3. Welded connections shall be tested for compliance according to IBC Table 1704.3, AWS D1.1 and the contract specifications and plans. As a minimum, the testing shall include the following:
   a. All complete penetration groove welds shall be tested 100 percent either by ultrasonic testing or by radiography.
   b. Partial penetration groove welds shall be tested either by ultrasonic testing or radiography. A minimum of 50% of these welds shall be tested.
   c. Base metal thicker than 1 1/2", when subjected to through thickness weld shrinkage strains, shall be ultrasonically inspected for discontinuities directly behind such welds and three inches above and below the weld after joint assembly completion.
   d. Any material discontinuities shall be accepted or rejected on the basis of the defect rating in accordance with the testing in AWS D1.1 Chapter 6, excluding Sections 6.1 through and including 6.6. All deficient welds shall be corrected and retested at no additional cost to the owner.
4. Post-installed anchors, including but not limited to expansion anchors, adhesive anchors, and low velocity fasteners, shall be tested per the code evaluation reports for the anchors.

E. Structural Observations by the Engineer of Record.
1. The Engineer of Record may perform structural observations at critical phases of the project. Copies of the engineer's report will be distributed to the architect, contractor, owner, and QAA.
2. Observation visits to the site by the Engineer's field representatives shall not be construed as inspection or approval of construction.
3. Notification of Engineer: The contractor shall notify the engineer twenty-four hours prior to:
   a. Placing concrete in any footing.
   b. Closing any wall forms.
   c. Placing concrete in any column, beam or suspended slab.
   d. Grouting any masonry.
   e. Completing the welding of major sections of steel decking.
   f. Completing the nailing of any plywood wall or deck.

F. Contractor Responsibility: The contractor shall prepare and submit a written statement of responsibility to the building official and the owner prior to commencement of work on the project. As a minimum the statement shall contain the following information:
1. Acknowledgement of the quality assurance requirements for the structure.
2. Acknowledgement of receipt of the Quality Assurance Implementation Plan (QAIP) from the testing agency.
3. Acknowledgement that control will be exercised to obtain conformance to the Contract Documents and the QAIP.
4. Quality control procedures within the contractors organization, methods and frequency of reporting, and distribution of the reports.
5. Identification and qualifications of the person(s) responsible for quality control and their position(s) in the organization.

## ABBREVIATIONS

| | | | | | |
|---|---|---|---|---|---|
| AB | ANCHOR BOLT (S) | F.D. | FLOOR DRAIN | NIC | NOT IN CONTRACT |
| ABV | ABOVE | FDTN | FOUNDATION | NTS | NOT TO SCALE |
| @ | AT | F.F. | FINISH FLOOR | | |
| ALT | ALTERNATE | FIN | FINISH | OPNG | OPENING |
| APPROX | APPROXIMATE | FL | FLOOR | OPP | OPPOSITE |
| ARCH | ARCHITECT(URAL) | FT | FOOT | O.C. | ON CENTER |
| | | FTG | FOOTING | O.F. | OUTSIDE FACE |
| BM | BEAM | FV | FIELD VERIFY | OWSJ | OPEN WEB STEEL JOIST |
| BLW | BELOW | | | | |
| | | GA | GAUGE | PCF | POUNDS/CUBIC FOOT |
| BRG | BEARING | GALV | GALVANIZED | PL | PLATE |
| BTWN | BETWEEN | GLB | GLU-LAMINATED BEAM | PLF | POUNDS/LINEAL FOOT |
| BLDG | BUILDING | GR | GRADE | PNL | PANEL |
| BOT | BOTTOM | GSN | GENERAL STRUCTURAL NOTES | PSF | POUNDS/SQ FOOT |
| | | | | PSI | POUNDS/SQ INCH |
| C.J. | CONSTRUCTION JOINT OR CONTROL JOINT | HB | HORIZONTAL BRIDGING | PT | POINT |
| CJP | COMPLETE JOINT PENETRATION | HT | HEIGHT | REINF | REINFORCING |
| | | HORIZ | HORIZONTAL | R.D. | ROOF DRAIN |
| CMU | CONC MASONRY UNIT | HSA | HEADED STUD ANCHORS | REQ'D | REQUIRED |
| COL | COLUMN | | | | |
| CONC | CONCRETE | IBC | INTERNATIONAL BUILDING CODE | SHT | SHEET |
| CONST | CONSTRUCTION | | | SI | SPECIAL INSPECTION |
| CONT | CONTINUOUS | ICBO | INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS | SOG | SLAB ON GRADE |
| CONTR | CONTRACTOR | | | STD | STANDARD |
| CTR | CENTER | ICC | INTERNATIONAL CODE COUNCIL | STIFF | STIFFENER |
| | | | | STL | STEEL |
| DB | DECK BEARING | IN. | INCH | SQ | SQUARE |
| DBA | DEFORMED BAR ANCHORS | INSUL | INSULATION | SIM | SIMILAR |
| | | INT | INTERIOR | STR | STRUCTURAL |
| DBL | DOUBLE | I.F. | INSIDE FACE | STAG | STAGGERED |
| DET | DETAIL | | | | |
| DIA | DIAMETER | JT | JOINT | T&B | TOP AND BOTTOM |
| DIM | DIMENSION | JST | JOIST | TEMP | TEMPERATURE |
| DN | DOWN | KLF | KIPS PER LINEAL FOOT | THDS | THREADS |
| DWG | DRAWING | KSF | KIPS PER SQUARE FOOT | T.O. | TOP OF |
| DWL | DOWEL | KSI | KIPS PER SQUARE INCH | TOC | TOP OF CONCRETE |
| | | K | KIPS - 1,000 POUNDS | TOF | TOP OF FOOTING |
| EA | EACH | | | TOS | TOP OF SLAB |
| E.J. | EXPANSION JOINT (SEISMIC SEPARATION JOINT) | LF | LINEAL FOOT | TOW | TOP OF WALL |
| | | LBS | POUNDS | TYP | TYPICAL |
| ELEV | ELEVATION | LLH | LONG LEG HORIZONTAL | | |
| ELEC | ELECTRICAL | LLV | LONG LEG VERTICAL | UNO | UNLESS NOTED OTHERWISE |
| EQUIP | EQUIPMENT | | | | |
| EQ | EQUAL | MAS | MASONRY | VERT | VERTICAL |
| EXIST | EXISTING | MAX | MAXIMUM | W/ | WITH |
| EXP | EXPANSION / EXPOSED | MCJ | MASONRY C.J. | WWF | WELDED WIRE FABRIC |
| EXT | EXTERIOR | MECH | MECHANICAL | | |
| E.F. | EACH FACE | MFR | MANUFACTURER | | |
| E.W. | EACH WAY | MIN | MINIMUM | | |
| | | MISC | MISCELLANEOUS | | |

## PLAN MARKS

| | | | | | |
|---|---|---|---|---|---|
| BF-# | BRACED FRAME | CSS-# | CONC SUSPENDED SLAB | ML-# | MASONRY LINTEL |
| | | CSW-# | CONC SHEAR WALL | MP-# | MASONRY PIER |
| CB-# | CONCRETE BEAM | CW-# | CONCRETE WALL | MW-# | MASONRY WALL |
| CC-# | CONCRETE COLUMN | | | | |
| CDP-# | CONC DRILLED PIER | FC# | CONTINUOUS FOOTING | PD-# | PLYWOOD DIAPHRAGM |
| CFW-# | CONC FDTN. WALL | FM# | MAT FOOTING | PSW-# | PLYWOOD SHEAR WALL |
| CGB-# | CONC GRADE BEAM | FR# | RECTANGULAR FOOTING | | |
| CJ-# | CONCRETE JOIST | FS# | SQUARE FOOTING | SBP-# | STEEL BASE PLATE |
| CL-# | CONCRETE LINTEL | FTS# | THICKEND SLAB FOOTING | SC-# | STEEL COLUMN |
| CP-# | CONCRETE PIER | | | SCP-# | STEEL CAP PLATE |
| CRW-# | CONC RETAINING WALL | MC-# | MASONRY COLUMN | SD-# | STEEL DECK |
| CSG-# | CONC SLAB ON GRADE | MF-# | MOMENT FRAME | | |

## SHEET NOTES


State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

REAVELEY ENGINEERS + ASSOCIATES
Consulting Structural Engineers
675 E. 500 S. Suite 400
Salt Lake City, UT 84102
P:801.486.3883
F:801.485.0911
www.reaveley.com


PROJECT NAME & ADDRESS

# WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT

## DFCM No. 07049810

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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PROJECT MANAGER: APB
DRAWN BY: CAT/REA
CHECKED BY: OWW
DATE: 4/11/08
WHW JOB NO.: 07037

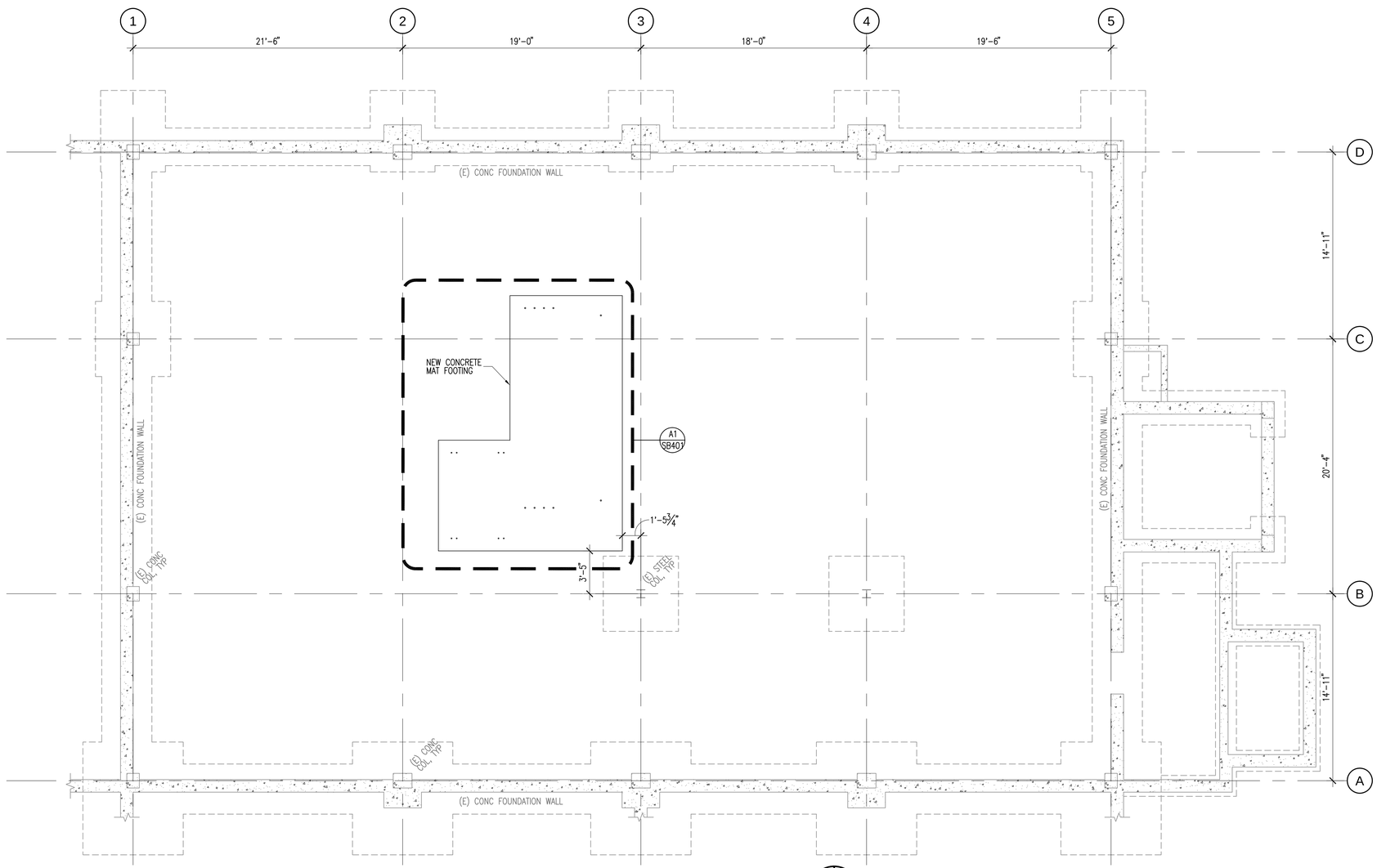
LICENSED CERTIFIED STRUCTURAL ENGINEER
NO. 154201
ARTHUR PARRY BROWN
UTAH

SHEET TITLE

**GENERAL STRUCTURAL NOTES**

SHEET NO.

# SE002




A2 SB101 FOOTING & FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

## SHEET NOTES

### EXISTING ITEMS PLAN LEGEND

LEG-EXIST

- EXISTING FOOTING – CONTINUOUS
- EXISTING FOOTING – THICKENED SLAB
- EXISTING FOOTING – SQUARE, RECTANGULAR, OR MAT
- EXISTING CONCRETE SHEAR WALL, FOUNDATION WALL OR RETAINING WALL
- EXISTING OPENING THROUGH CONCRETE WALL
- EXISTING CONCRETE PIER IN CONCRETE WALL. PIER RECESSED 8" BELOW SLAB. TYP U.N.O.
- EXISTING CONCRETE COLUMN
- EXISTING STEEL COLUMN – WIDE FLANGE
- EXISTING TO BE REMOVED
- EXISTING OPENING

### FOOTING & FOUNDATION PLAN LEGEND

LEG-FOOTING

- FS FOOTING STEP
- FOOTING – CONTINUOUS
- FOOTING – THICKENED SLAB
- FOOTING – SQUARE FOOTING – RECTANGULAR FOOTING – MAT FOOTING
- STEEL COLUMN – TUBE
- STEEL COLUMN – WIDE FLANGE
- STEEL COLUMN – PIPE
- 6" CHANGE IN ELEVATION
- SLAB BLOCK–OUT AT COLUMN
- CJ SLAB CONTROL/CONSTRUCTION JOINT
- SPECIAL SLAB AREA
- RECESSED/DEPRESSED SLAB
- OPENING

### FOOTING & FOUNDATION PLAN NOTES

NOTE-FOOTING

1. SEE ARCHITECTURAL DRAWINGS FOR SLAB DEPRESSIONS AND SLOPES TO DRAINS, ETC.
2. REFER TO GENERAL STRUCTURAL NOTES AND SEE B4/SB401 FOR COMPACTED STRUCTURAL FILL REQUIREMENTS BELOW FOOTINGS.


**State of Utah**
Department of Administrative Services

Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us


## CONSULTANTS


**WHW ENGINEERING INC.**
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

**REAVELEY**
ENGINEERS + ASSOCIATES
Consulting Structural Engineers
675 E. 500 S. Suite 400
Salt Lake City, UT 84102
P:801.486.3883
F:801.485.0911
www.reaveley.com


PROJECT NAME & ADDRESS

# WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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PROJECT MANAGER: APB
DRAWN BY: CAT/REA
CHECKED BY: OWW
DATE: 4/11/08
WHW JOB NO.: 07037

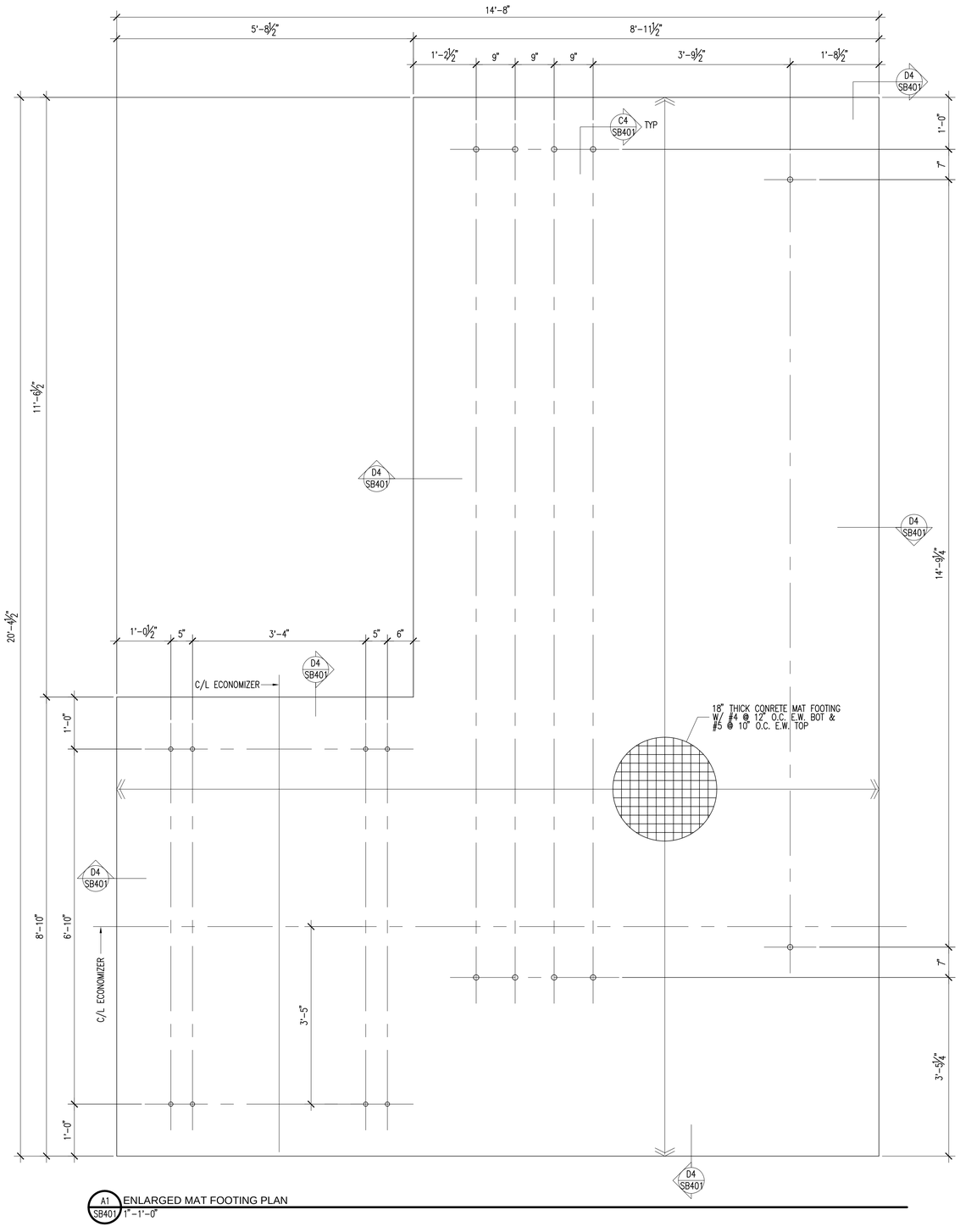
LICENSED CERTIFIED STRUCTURAL ENGINEER NO. 154201 ARTHUR PARRY BROWN UTAH

SHEET TITLE

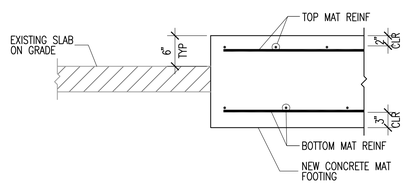
**FOOTING AND FOUNDATION PLAN**

SHEET NO.

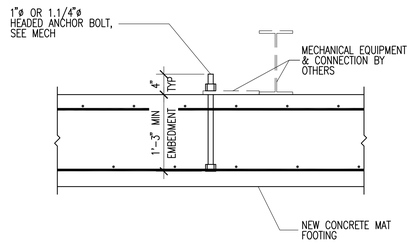
**SB101**



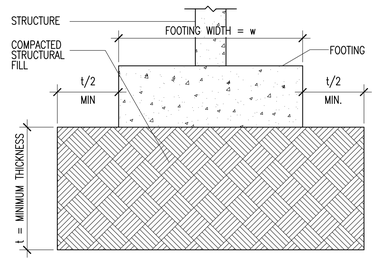

A1 SB401 ENLARGED MAT FOOTING PLAN
1"=1'-0"




D4 SB401 TYPICAL CONCRETE MAT FOOTING
NO SCALE
2008-019-SB401/D4




C4 SB401 TYPICAL ANCHOR BOLT DETAIL
NO SCALE
2008-019-SB401/C4




COMPACTED STRUCTURAL FILL:
ALL FILL MATERIAL SHALL BE A WELL-GRADED GRANULAR MATERIAL WITH A MAXIMUM SIZE LESS THAN 3 INCHES AND WITH NOT MORE THAN 10 PERCENT PASSING A NO. 200 SIEVE. IT SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM LABORATORY DENSITY AS DETERMINED BY ASTM D-1557. ALL FILL SHALL BE TESTED (SEE SPECIFICATIONS).

B4 SB401 TYP COMPACTED STRUCTURAL FILL DETAIL
NO SCALE
CF-TYP09

## SHEET NOTES

### PLAN NOTES
NOTE-PLAN

1. ANCHOR BOLT LOCATION IS BASED ON INFORMATION FROM BABCOCK & WILCOX DRAWINGS. ACTUAL ANCHOR BOLT LOCATION SHALL BE COORDINATED WITH EQUIPMENT SUPPLIER BEFORE FOUNDATION INSTALLATION.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4110 State Office Building
Salt Lake City, Utah 84114
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Fax: (801) 538 - 3267

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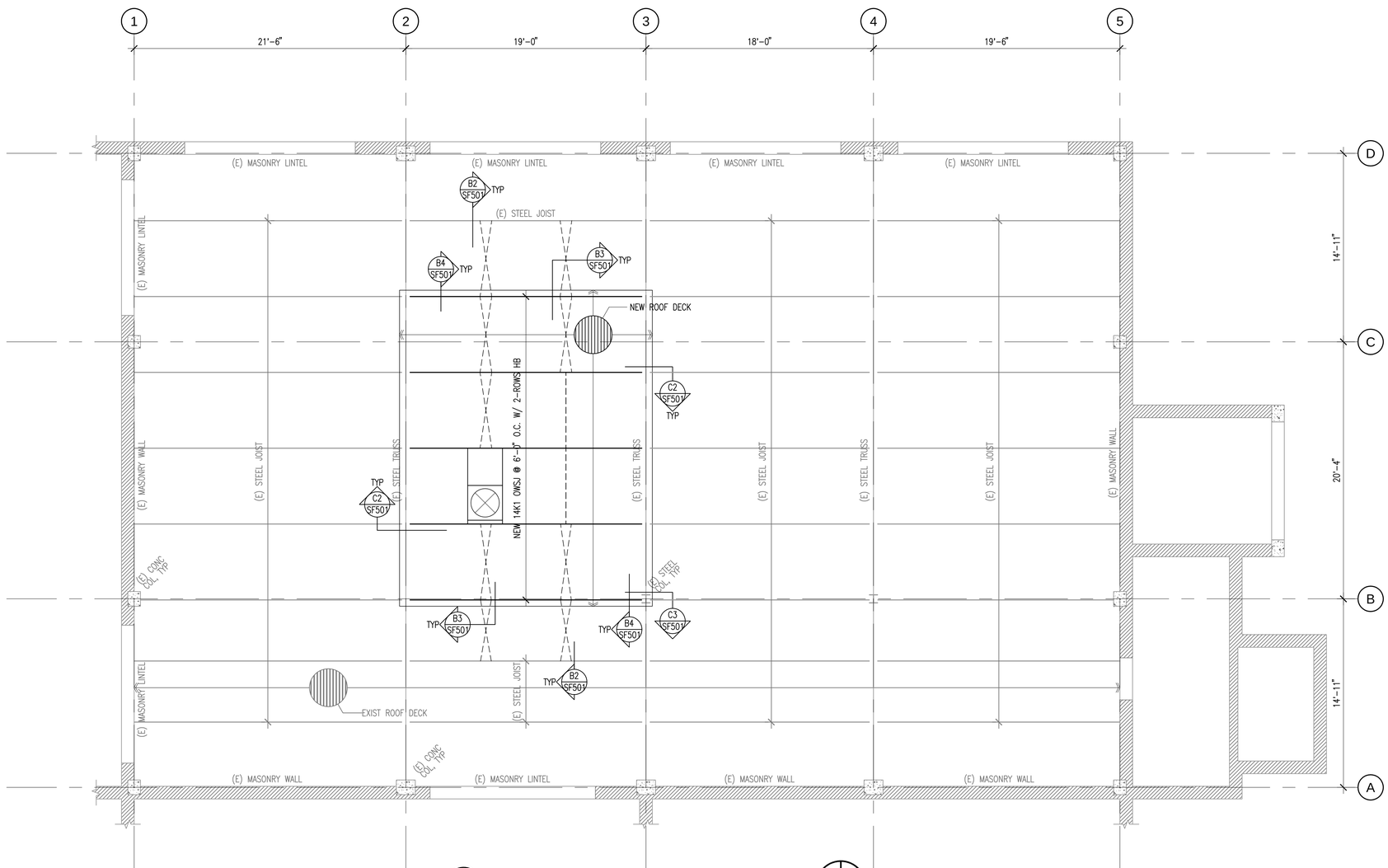
LICENSED CERTIFIED STRUCTURAL ENGINEER
NO. 154201
ARTHUR PARRY BROWN
UTAH

SHEET TITLE
**ENLARGED MAT FOOTING PLAN & DETAILS**

SHEET NO.
**SB401**




A2 / SF101 ROOF FRAMING PLAN
SCALE: 1/4" = 1'-0"

NORTH

# SHEET NOTES

## EXISTING ITEMS PLAN LEGEND

LEG-EXIST

- EXISTING CONCRETE COLUMN
- EXISTING MASONRY WALL
- EXISTING OPENING THROUGH MASONRY WALL
- EXISTING MASONRY COLUMN IN MASONRY WALL
- EXISTING STEEL COLUMN – WIDE FLANGE
- EXISTING STEEL BEAM OR GIRDER
- EXISTING STEEL JOIST OR PURLIN
- EXISTING CROSS BRIDGING
- EXISTING HORIZONTAL BRIDGING
- EXISTING TO BE REMOVED
- EXISTING OPENING

## ROOF FRAMING PLAN LEGEND

LEG-ROOF

- STEEL BEAM OR GIRDER
- STEEL JOIST OR PURLIN
- CROSS BRIDGING
- HORIZONTAL BRIDGING
- ROOF DECK
- SPECIAL DECK AREA
- RECESSED/DEPRESSED SLAB ON METAL DECK
- OPENING

## ROOF FRAMING PLAN NOTES

NOTE-ROOF

1. ALL ROOF OPENINGS SHALL BE FRAMED AS INDICATED IN DETAIL D3/SF501. FOR ROUND OPENINGS WHICH ARE LESS THAN 12"ø SEE DETAIL D4/SF501.
2. SEE ARCHITECTURAL FOR ROOF SLOPES AND DRAINS. SEE C5/SF501 FOR ROOF DRAIN OPENING FRAME.
3. OPEN WEB STEEL JOISTS AND JOIST GIRDERS SHALL BE DESIGNED BY THE MANUFACTURER TO SUPPORT THE MECHANICAL AND LATERAL LOADS SHOWN ON THE ROOF FRAMING PLANS IN ADDITION TO THE UNIFORM AND POINT LOADS SHOWN.
4. ALL LOADS SUPPORTED BY OPEN WEB STEEL JOISTS AND GIRDERS SHALL BE LOCATED WITHIN 6" OF JOIST OR GIRDER PANEL POINT OR THE JOIST OR GIRDER SHALL BE REINFORCED PER DETAIL D1/SF501.
5. HORIZONTAL AND CROSS BRIDGING SHALL BE SIZED AND SUPPLIED BY THE JOIST MANUFACTURER. CONNECT TO WALLS AS INDICATED IN DETAILS.
6. WHERE SKYLIGHTS OR MECHANICAL UNITS INTERRUPT HORIZONTAL BRIDGING PROVIDE CROSS BRIDGING AT JOIST SPACES ON EACH SIDE. TYPICAL.
7. REPLACE ALL STEEL DECK & OPEN WEB STEEL JOISTS REMOVED FOR THE REPLACEMENT OF THE OLD MECHANICAL EQUIPMENT.
8. PAINT STRUCTURAL STEEL AND DECK TO MATCH EXISTING.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1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
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EMAIL: excellence@whw-engineering.com

**REAVELEY**
ENGINEERS + ASSOCIATES
Consulting Structural Engineers
675 E. 500 S. Suite 400
Salt Lake City, UT 84102
P:801.486.3883
F:801.485.0911
www.reaveley.com


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
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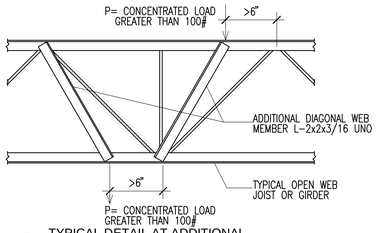
PROJECT MANAGER: APB
DRAWN BY: CAT/REA
CHECKED BY: OWW
DATE: 4/11/08
WHW JOB NO.: 07037

LICENSED CERTIFIED STRUCTURAL ENGINEER
NO. 154201
ARTHUR PARRY BROWN
UTAH

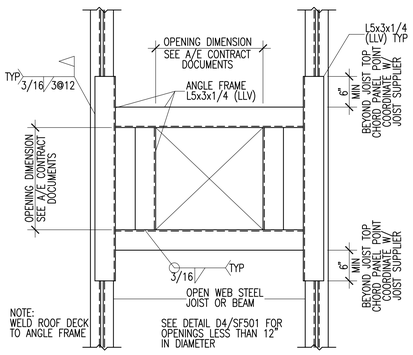
SHEET TITLE
**ROOF FRAMING PLAN**

SHEET NO.
**SF101**

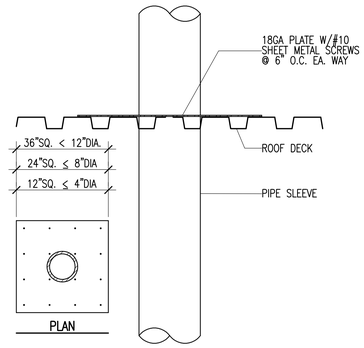
NOTE:
WHEN CONCENTRATED LOADS (GREATER THAN 100#) ON OPEN WEB JOISTS OR GIRDERS ARE LOCATED MORE THAN 6 INCHES FROM THE PANEL WORKPOINTS AT EITHER THE TOP OR BOTTOM CHORD ADDITIONAL DIAGONAL WEB MEMBERS SHALL BE FURNISHED AND INSTALLED AT THE LOCATION OF THE CONCENTRATED LOAD BY THE CONTRACTOR. CONCENTRATED POINT LOADS, SINGLE OR MULTIPLE, TOTALING 100# OR LESS CAN BE LOCATED AT ANY POINT ALONG THE TOP OR BOTTOM CHORD OF AN OPEN WEB JOIST OR GIRDER BETWEEN ADJACENT PANEL POINTS WITHOUT MEETING THESE REQUIREMENTS. A LIMIT OF FOUR CONCENTRATED 100# MAX. POINT LOADS PER JOIST OR GIRDER WILL BE PERMITTED ON SPANS OF 12' & GREATER. ONE CONCENTRATED 100# MAX. LOAD ON SPANS LESS THAN 12', UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. JOIST BRIDGING SHALL NEVER BE USED TO SUPPORT HANGING LOADS.



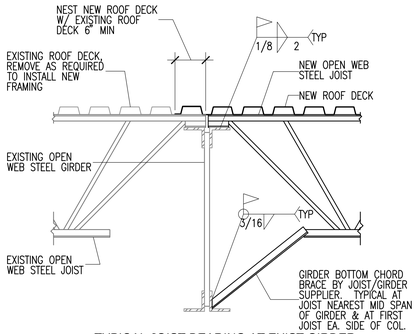

D2 / SF501 TYPICAL DETAIL AT ADDITIONAL CONCENTRATED POINT LOAD
NO SCALE
JK1RTS12



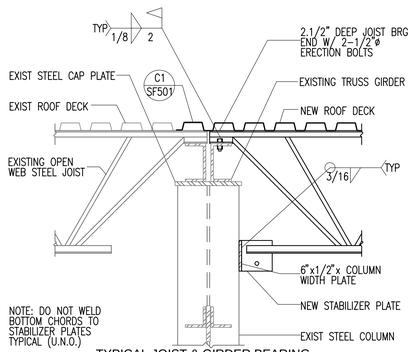

D3 / SF501 TYPICAL ROOF OPENING DETAIL (PLAN VIEW)
NO SCALE
2008-019-SF501/D3



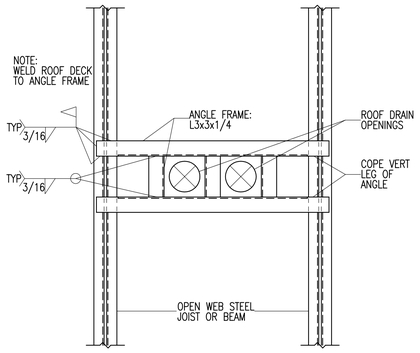

D4 / SF501 TYPICAL PIPE SLEEVE HOLE THRU ROOF DECK
NO SCALE
JK2RTS09



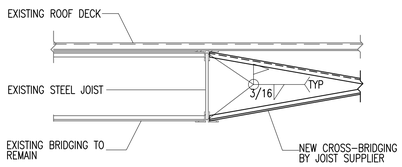

C2 / SF501 TYPICAL JOIST BEARING AT EXIST GIRDER W/ DRAG STRUT/CHORD TIE
NO SCALE
2008-019-SF501/C1



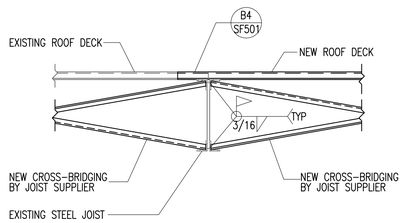

C3 / SF501 TYPICAL JOIST & GIRDER BEARING ON EXISTING STEEL COLUMN
NO SCALE
2008-019-SF501/C3



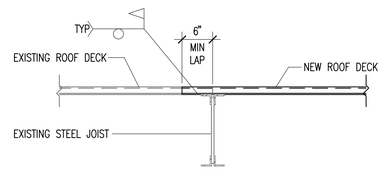

C5 / SF501 TYPICAL ROOF DRAIN OPENING (PLAN VIEW)
NO SCALE
JK2RTS15




B2 / SF501 TYPICAL NEW BRIDGING CONNECTION
NO SCALE
2008-019-SF501/B2




B3 / SF501 NEW ROOF STEEL DECK AT EXISTING OPEN WEB STEEL JOIST WITH BRIDGING
NO SCALE
2008-019-SF501/B3




B4 / SF501 NEW ROOF STEEL DECK AT EXISTING OPEN WEB STEEL JOIST
NO SCALE
2008-019-SF501/B4

## SHEET NOTES


State of Utah
Department of Administrative Services
Division of Facilities
Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us


## CONSULTANTS


WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
1354 East 3300 South Suite 200
SALT LAKE CITY, UTAH 84106
(801)466-4021, FAX 466-8536
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NO. 154201
ARTHUR PARRY BROWN
UTAH

SHEET TITLE
**ROOF FRAMING DETAILS**

SHEET NO.
**SF501**

## MECHANICAL LEGEND

| SYMBOL | ABR. | DESCRIPTION |
|---|---|---|
| GENERAL TERMINOLOGY | | |
| A / ME-101 | | SECTION LETTER DESIGNATION<br>SECTION DRAWN ON THIS SHEET |
| A2 | | DETAIL NUMBER DESIGNATION CORRESPONDING WITH GRID LOCATION |
| AH / 1 | | MECHANICAL EQUIPMENT DESIGNATION<br>EQUIPMENT ITEM DESIGNATION |
| 1 | | REVISION DESIGNATOR AND NUMBER |
| 1 | | KEY NOTE DESIGNATOR AND NUMBER |
| | POC | POINT OF CONNECTION |
| | POR | POINT OF REMOVAL |
| AFF | | ABOVE FINISHED FLOOR |
| ℄ EL. | | CENTER LINE ELEVATION |
| GC | | GENERAL CONTRACTOR |
| MC | | MECHANICAL CONTRACTOR |
| EC | | ELECTRICAL CONTRACTOR |
| CC | | CONTROLS CONTRACTOR |
| NIC | | NOT IN CONTRACT |
| NTS | | NOT TO SCALE |
| SYMBOL | ABR. | DESCRIPTION |
| | | EXISTING EQUIPMENT TO BE REMOVED |
| | | EXISTING EQUIPMENT TO REMAIN |
| | | NEW EQUIPMENT |

| SYMBOL | ABR. | DESCRIPTION |
|---|---|---|
| WET SIDE | | |
| | | UNION |
| | | MANUAL ACTUATOR (BALL, BUTTERFLY, NEEDLE, ETC. VALVES) |
| | | MANUAL ACTUATOR (GATE, GLOBE, S&D, OS&Y, ETC. VALVES) |
| | | THREADED OR SWEAT VALVE CONNECTION |
| | | NEEDLE VALVE |
| | | FLANGED VALVE CONNECTION |
| | | BUTTERFLY VALVE |
| | | GATE VALVE |
| | | CHECK VALVE |
| | PRV | PRESSURE REDUCING VALVE |
| | CBV | CIRCUIT BALANCING VALVE |
| | BV | BALL VALVE |
| P | PRV | PRESSURE RELIEF VALVE |
| | | AUTOMATIC AIR VENT |
| | | MANUAL AIR VENT |
| | | STRAINER |
| | | STRAINER W/ PLUGGED BLOW OFF |
| | VTI | VENTURI |
| | | PRESSURE GAUGE AND GAUGE COCK - WATER |
| | | THERMOMETER AND THERMOWELL |
| | TW | THERMOWELL |
| | | DIRECTION OF FLOW |
| | | PRESSURE GAUGE WITH SIPHON LOOP STEAM |

| SYMBOL | ABR. | DESCRIPTION |
|---|---|---|
| WET SIDE CONT | | |
| | | SLOPE |
| | | ELBOW UP |
| | | ELBOW DOWN |
| | | TEE UP |
| | | TEE DOWN |
| | | EXISTING PIPING TO BE REMOVED |
| | | EXISTING PIPING TO REMAIN |
| | | NEW PIPING |
| | | PIPE CAP OR PLUG |
| | | CONCENTRIC REDUCER |
| | | ECCENTRIC REDUCER |
| | | EXPANSION JOINT |
| G | | NATURAL GAS PIPING |
| | CW | CULINARY COLD WATER |
| D | | EQUIPMENT DRAIN |
| CR | | CONDENSATE RETURN |
| HPR | | HIGH PRESSURE RETURN |
| PC | | PUMPED CONDENSATE |
| | | GLOBE VALVE |
| BFW | | BOILER FEEDWATER |
| FOS | | FUEL OIL SUPPLY |
| FOR | | FUEL OIL RETURN |
| AS | | ATOMIZATION STEAM |
| | BPV | BACK PRESSURE VALVE |

GENERAL NOTES:

G-1 MECHANICAL INFORMATION IS NOT LIMITED TO THE MECHANICAL DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENTS INCLUDING DRAWINGS BY OTHER DISCIPLINES AND SPECIFICATIONS.

A - EACH DRAWING SHEET AND THE SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND THEY SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH ITEMS SHOWN AND NOTED ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGH SHOWN AND CALLED OUT IN ALL PLACES. ITEMS IN SPECIFICATIONS OR DRAWINGS LISTED WHICH ARE DIFFERING IN EFFICIENCY OR QUALITY SHALL BE HELD TO THE GREATEST OF: EFFICIENCY, QUALITY OR GOVERNING CODE.

B - THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE INSTALLATION OF THE SYSTEMS ACCORDING TO THE TRUE INTENT AND MEANING OF THE CONTRACT DOCUMENTS.

C - THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT WITH PROPER SERVICE ACCESS AND CLEARANCES ACCORDING TO MANUFACTURERS RECOMMENDATIONS. THE CONTRACTOR SHALL REVIEW SUPPLIERS BID PACKAGES FOR COMPLETENESS AND COMPLIANCE TO THE SPECIFICATIONS, SCHEDULES, AND DESIGN INTENT (ALL EQUIPMENT AND METHODS). THE CONTRACTOR SHALL REMOVE AND REINSTALL CORRECTLY AT HIS OWN EXPENSE ANY EQUIPMENT NOT IN COMPLIANCE.

D - THE CONTRACTOR SHALL CONSULT MANUFACTURERS INSTALLATION INSTRUCTIONS FOR SIZES, METHODS, ACCESSORIES, AND CLEARANCES IN SPACE AVAILABLE PRIOR TO BIDDING PROJECT.

E - ANYTHING NOT CLEAR OR IN CONFLICT WILL BE EXPLAINED BY MAKING APPLICATION TO THE ENGINEER IN WRITING.

G-2 ANY AND ALL ALTERATIONS TO THE SYSTEM SHOWN SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO CHANGES FOR APPROVAL. CONTRACTOR SHALL NOT START ANY CHANGES UNTIL NOTIFIED IN WRITING. IF CHANGES ARE MADE PRIOR TO APPROVAL CONTRACTOR SHALL TAKE ALL RESPONSIBILITY FOR THE CHANGES MADE AND ALL COSTS RELATING TO FAILURE OR REPLACEMENT OF ALTERATIONS.

G-3 CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATIONS.

G-4 THE WORKING DRAWINGS ARE DIAGRAMMATIC. THEY DO NOT SHOW EVERY OFFSET, BEND, OR ELBOW NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. ALL LOCATIONS FOR MECHANICAL EQUIPMENT SHALL BE FIELD VERIFIED AND COORDINATED WITH ALL DRAWINGS. THE CONTRACTOR SHALL PROVIDE OR COORDINATE WITH THE GENERAL CONTRACTOR PROVISIONS FOR BLOCKOUTS OR CORE DRILLS THROUGH STRUCTURE.

G-5 THE INSTRUCTION TO "PROVIDE" ALSO INCLUDES INSTALLATION.

G-6 SHEET METAL DUCT SIZES SHOWN ON DRAWINGS ARE FREE AREA DIMENSIONS.

G-7 THE MECHANICAL CONTRACTOR SHALL VERIFY MOTOR VOLTAGES WITH THE ELECTRICAL DRAWING BEFORE ORDERING MOTORIZED EQUIPMENT AND CONTROLS.

G-8 SUPPLIERS SHALL REVIEW ALL DRAWINGS AND THE SPECIFICATIONS PRIOR TO SUBMITTING PRICES TO THE CONTRACTOR. ALL QUESTIONS AND DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BIDDING.

G-9 CONTRACTOR SHALL THOROUGHLY REVIEW AND SIGN SUBMITTALS FOR COMPLETENESS AND COMPLIANCE TO THE SPECIFICATIONS PRIOR TO ENGINEERS REVIEW. SUPPLIERS SHALL HIGHLIGHT OR MARK ALL INFORMATION REQUIRED TO SHOW COMPLIANCE TO THE SPECIFICATIONS. ALL REQUESTED EXCEPTIONS TO THE SPECIFICATIONS, OR SCHEDULES SHALL BE CLEARLY NOTED AND EXPLAINED. SUBMITTAL REVIEW AND ACCEPTANCE IS FOR DESIGN CONCEPT ONLY, AND DOES NOT AT ANY TIME RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO MEET SPECIFICATIONS, CAPACITIES, OR DESIGN INTENT.

G-10 ALL MECHANICAL AND PLUMBING SHALL BE INSTALLED AND CONFORM TO THE 2006 EDITION OF THE IMC AND IPC WITH UTAH ANNOTATIONS AND REQUIREMENTS.

G-11 THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE DRAINING DOWN AND RE-FILLING OF ALL SYSTEMS NECESSARY TO COMPLETE THE WORK OUTLINED BY THIS PROJECT.

G-12 ALL PIPING, MATERIALS, ETC. SHALL BE NEW AND DOMESTIC MADE UNLESS SPECIFICALLY AUTHORIZED IN WRITING PRIOR TO BID.


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4110 State Office Building
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CONSULTANTS


WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
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SANDY, UTAH 84070
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**DFCM No. 07049810**

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PROJECT MANAGER: SLW
DRAWN BY: LGD
CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

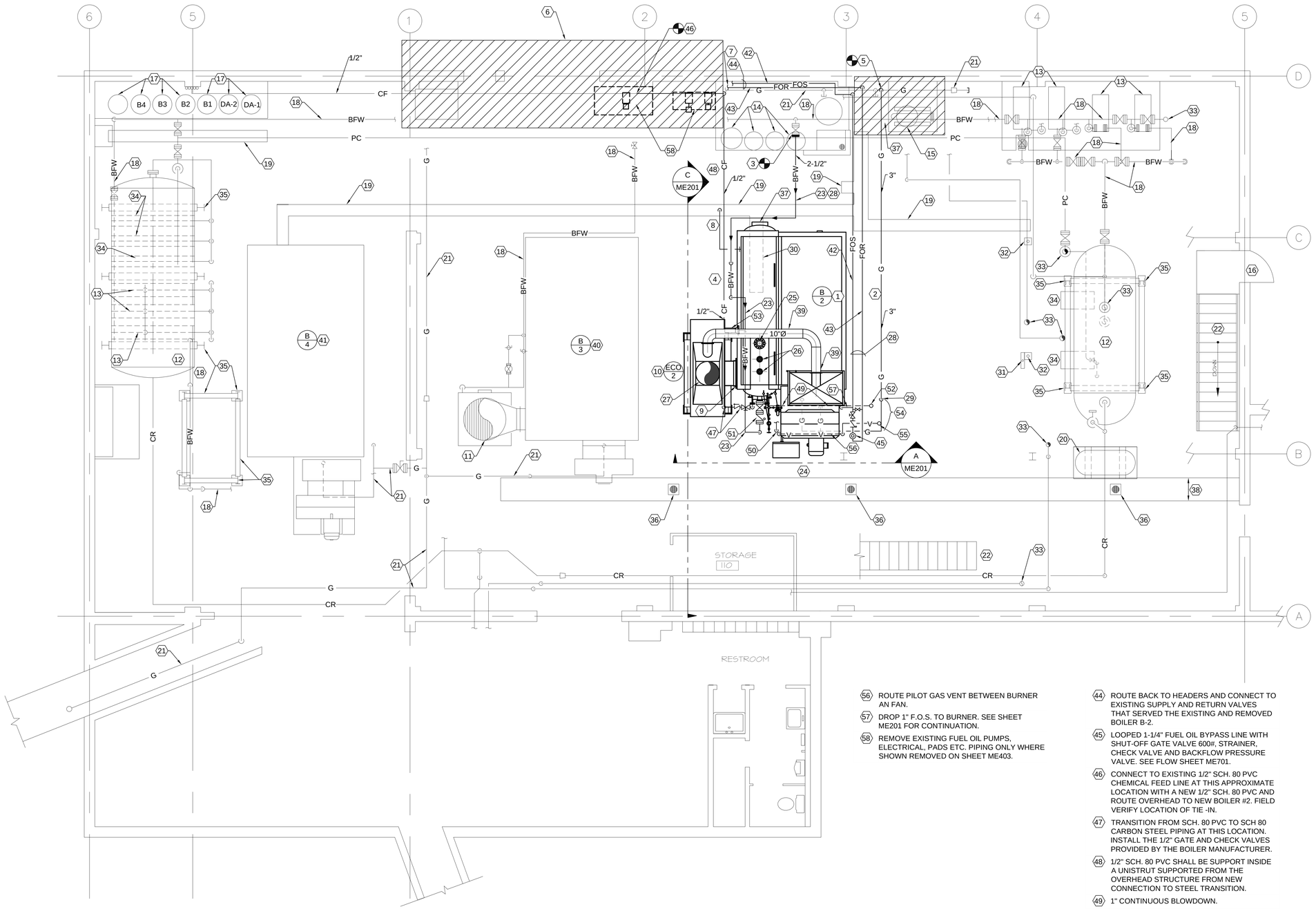
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

**MECHANICAL GENERAL NOTES AND LEGEND**

SHEET NO.

**M001**




## LOWER LEVEL BOILER ROOM PLAN

SCALE: 1/4" = 1'-0"

SHEET NOTES:

1. NEW 30,000 #1HR BOILER, LOCATE AS SHOWN. FIELD VERIFY ROUTING OF BOILER PATH FROM ROOF TO PAD. SEE STRUCTURAL DRAWINGS FOR FOUNDATION DETAILS.
2. NEW BOILER CONCRETE PAD. SEE STRUCTURAL DRAWINGS FOR DETAILS.
3. CONNECT NEW 3" BOILER FEED WATER TO EXISTING 2-1/2" VALVE AT THIS LOCATION. FIELD VERIFY EXACT LOCATION. PROVIDE COMPANION FLANGE TO MEET PRESSURE OF EXISTING VALVE.
4. PROVIDE NEW BOILER FEEDWATER CONTROL STATION. SEE PIPING ISOMETRIC A3/ME901.
5. CONNECT NEW 3" GAS PIPING TO EXISTING GAS PIPING AT THIS LOCATION. FIELD VERIFY EXACT LOCATION.
6. SEE SHEET ME403 FOR LARGE SCALE PLAN AND ELEVATION OF THIS AREA.
7. CONNECT NEW 1-1/4" FUEL OIL RETURN PIPING TO EXISTING 1-1/4" VALVE ON RETURN HEADER THAT SERVED THE REMOVED BOILER #2. REMOVE CAP LEFT BY DEMOLITION CONTRACTOR. SEE SHEET ME403.
8. PROVIDE 1-1/4" BOILER BLOWDOWN PIPING COMPLETE WITH TANDEM VALVES, SUPPORTS, ETC. SEE DETAIL A2 AND C2 SHEET ME402.
9. INSTALL NEW FLEXIBLE STACK CONNECTION TO NEW BOILER PROVIDED BY BOILER MANUFACTURER.
10. INSTALL NEW ECONOMIZER PROVIDED BY OTHERS. SEE DETAILS AND ARRANGEMENTS ON SHEET ME401.
11. EXISTING BOILER #3 ECONOMIZER SHALL REMAIN.
12. EXISTING CONDENSATE RECEIVER TANKS SHALL REMAIN.
13. EXISTING BOILER FEEDWATER PUMPS SHALL REMAIN.
14. EXISTING WATER SOFTENING SYSTEM SHALL REMAIN.
15. EXISTING NIPPER SHALL REMAIN. SEE LARGE SCALE PLAN AND ELEVATION A4 AND C4 ON SHEET ME402.
16. EXISTING DOOR TO GRADE.
17. EXISTING TREATMENT TANKS SHALL REMAIN. 1/2" TREATMENT LINE TO REMOVED BOILER #1 SHALL BE REMOVED AND CAPPED AT PUMP VALVE. SEE NOTES 46, 47, 48.
18. EXISTING BOILER FEEDWATER PIPING SHALL REMAIN.
19. EXISTING TRENCH DRAIN SYSTEM SHALL REMAIN.
20. EXISTING AIR COMPRESSOR SHALL REMAIN.
21. EXISTING GAS PIPING SHALL REMAIN.
22. EXISTING STAIRS FROM BOILER ROOM FLOOR TO EXIT AND CONTROL ROOM.
23. 2-1/2" BOILER FEED WATER TO ECONOMIZER AND NEW BOILER. SEE PIPING ISOMETRIC A3/ME901.
24. SEE BOILER FRONT PIPING ELEVATIONS AND DETAILS SHEET ME201.
25. SEE ME102 FOR STEAM PIPING FROM NEW BOILER TO EXISTING STEAM HEADER CONNECTION.
26. SEE ME102 FOR RELIEF VALVES AND RELIEF PIPING THROUGH ROOF. SEE DETAIL D5/ME501.
27. 27" DIA. BOILER STACK THROUGH ROOF. SEE DETAIL A3/ME501.
28. ROUTE GAS, FUEL OIL, BLOWDOWN, AND BOILER FEEDWATER PIPING A MINIMUM OF 9'-6" ABOVE FLOOR TO CENTER LINE OF PIPING.
29. DROP GAS LINE DOWN AND CONNECT TO GAS TRAIN. SEE GAS TRAIN ISOMETRIC SHEET C3/ME901.
30. FILL EXISTING TRENCH AND PROVIDE NEW BOILER FOUNDATION. SEE STRUCTURAL SB401 DRAWINGS FOR FILL AND NEW PAD FOUNDATION.
31. 2" DRAIN THROUGH FLOOR AND TROUGH SHALL REMAIN. REMOVE DRAIN PIPING IN TROUGH THAT IS NO LONGER USED. VERIFY WHAT WAS REMOVED BY DEMOLITION CONTRACTOR.
32. EXISTING PIPE SUPPORTS.
33. SEE SHEET ME102 FOR CONTINUATION.
34. EXISTING CONDENSATE TRANSFER PUMPS SHALL REMAIN.
35. EXISTING DEAERATOR AND CONDENSATE RECEIVER TANK, STRUCTURAL SUPPORTS SHALL REMAIN.
36. EXISTING FLOOR DRAINS IN INDENTED FLOOR SHALL REMAIN.
37. SEE PLAN AND ELEVATION SHEET ME402 FOR DETAIL OF CONTINUOUS BLOWDOWN PIPING THIS AREA.
38. EXISTING FLOOR INDENTATION.
39. NEW 10" DIA. F.G.R DUCT- PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY THIS CONTRACTOR.
40. EXISTING BOILER #3 SHALL REMAIN.
41. EXISTING BOILER #4 SHALL REMAIN.
42. NEW 1-1/2" FUEL OIL SUPPLY TO NEW BURNER SEE SHEET ME201 FOR ELEVATION AND SHEETS ME403 AND ME701 FOR DETAILS.
43. NEW 1-1/4" FUEL OIL RETURN PIPING. SEE SHEETS ME201 FOR ELEVATION AND SHEETS ME403 AND ME701 FOR DETAILS AND FLOW SHEETS.
44. ROUTE BACK TO HEADERS AND CONNECT TO EXISTING SUPPLY AND RETURN VALVES THAT SERVED THE EXISTING AND REMOVED BOILER B-2.
45. LOOPED 1-1/4" FUEL OIL BYPASS LINE WITH SHUT-OFF GATE VALVE 600#, STRAINER, CHECK VALVE AND BACKFLOW PRESSURE VALVE. SEE FLOW SHEET ME701.
46. CONNECT TO EXISTING 1/2" SCH. 80 PVC CHEMICAL FEED LINE AT THIS APPROXIMATE LOCATION WITH A NEW 1/2" SCH. 80 PVC AND ROUTE OVERHEAD TO NEW BOILER #2. FIELD VERIFY LOCATION OF TIE -IN.
47. TRANSITION FROM SCH. 80 PVC TO SCH 80 CARBON STEEL PIPING AT THIS LOCATION. INSTALL THE 1/2" GATE AND CHECK VALVES PROVIDED BY THE BOILER MANUFACTURER.
48. 1/2" SCH. 80 PVC SHALL BE SUPPORT INSIDE A UNISTRUT SUPPORTED FROM THE OVERHEAD STRUCTURE FROM NEW CONNECTION TO STEEL TRANSITION.
49. 1" CONTINUOUS BLOWDOWN.
50. 1-1/4" ATOMIZING STEAM SUPPLY FROM HEATER. DROP TO CONNECTION ON BURNER. PROVIDE 1-1/4" 800# GATE VALVE AND 1-1/4" TO 3/4" REDUCER AT BURNER CONNECTION.
51. INSTALL 300# GATE AND GLOBE VALVES. PROVIDE BY BOILER MANUFACTURER.
52. RISE UP TO 9'-6" ℄ PIPE FROM FLOOR. SEE SHEET ME102 FOR CONTINUATION OF CONTINUOUS BLOW DOWN PIPING.
53. PROVIDE FINISHED PANEL WITH REMOTE PRESSURE AND TEMPERATURE GAUGES FROM BOILER FEEDWATER INLET AND OUTLET OF ECONOMIZER. MOUNT PANEL TO STRUCTURAL SUPPORTS SUPPORTING ECONOMIZER.
54. MAKE SPOOL LONG ENOUGH TO INCLUDE 3" FLANGED PLUG VALVE, 3" FLANGED STRAINER, 3" FLANGED PRESSURE REGULATOR, REDUCERS, NIPPLES ETC.
55. 2" GAS VENT THRU ROOF. FIELD VERIFY ROUTING TO MISS STRUCTURAL, ELECTRICAL, AND PIPING ETC. SEE SHEET ME201 FOR CONTINUATION.
56. ROUTE PILOT GAS VENT BETWEEN BURNER AN FAN.
57. DROP 1" F.O.S. TO BURNER. SEE SHEET ME201 FOR CONTINUATION.
58. REMOVE EXISTING FUEL OIL PUMPS, ELECTRICAL, PADS ETC. PIPING ONLY WHERE SHOWN REMOVED ON SHEET ME403.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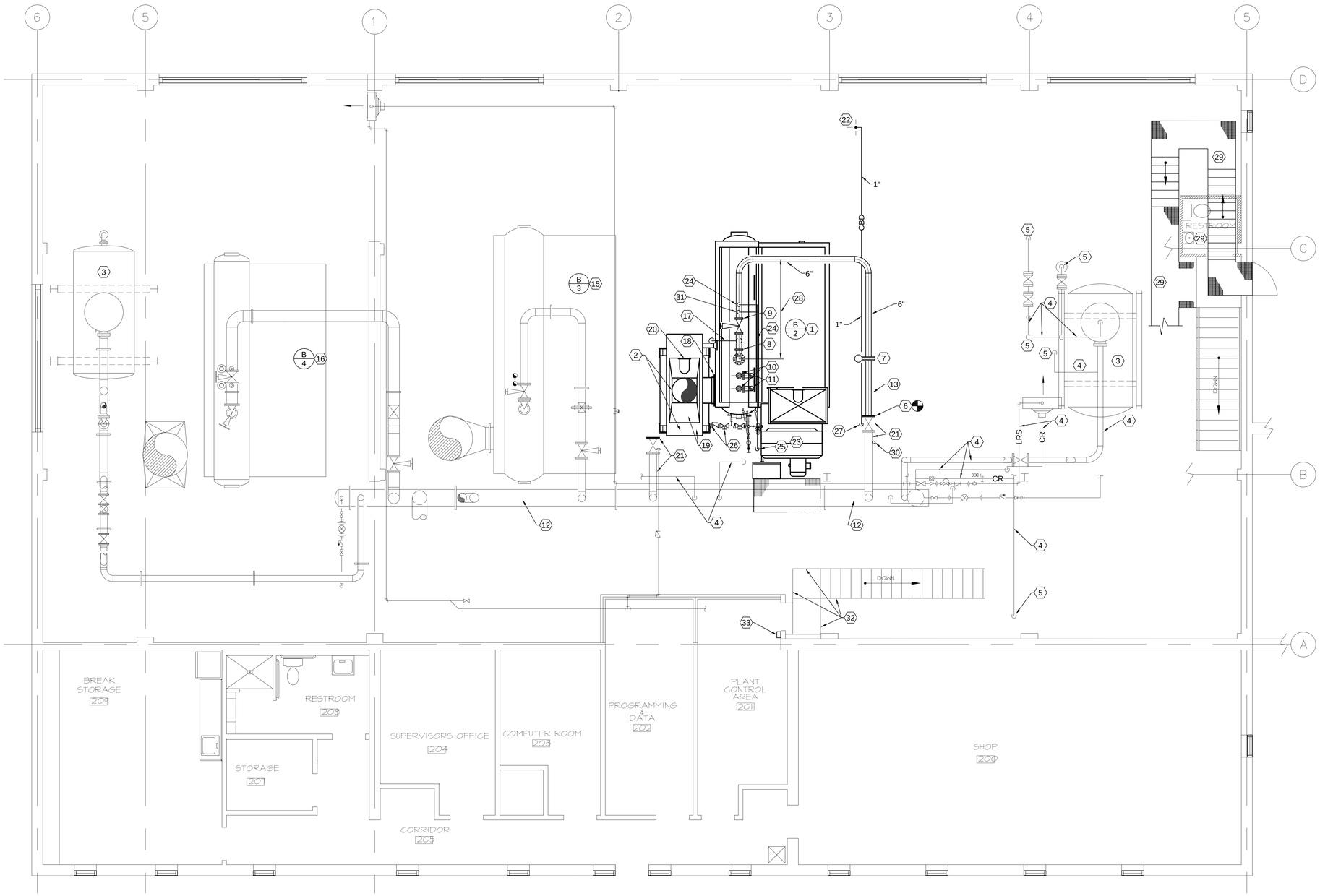
SHEET TITLE

**LOWER LEVEL BOILER ROOM MECHANICAL AND PIPING PLAN**

SHEET NO.

**ME101**




## UPPER LEVEL BOILER ROOM PLAN

SCALE: 1/4" = 1'-0"

SHEET NOTES:

1. NEW 30,000 #/HR STEAM BOILER B2.
2. NEW ECONOMIZER ECO-2 AND STACK THROUGH ROOF. SEE NOTE 19 BELOW.
3. EXISTING DEAERATOR SHALL REMAIN.
4. EXISTING CONDENSATE PIPING, MAKE-UP WATER, STEAM, ETC. SHALL REMAIN.
5. SEE SHEET ME101 FOR CONTINUATION.
6. REMOVE 6" - 300# BLIND FLANGE AND MAKE NEW CONNECTION FOR NEW 6" STEAM PIPING FROM NEW BOILER. PROVIDE NEW 6" -300# COMPANION FLANGE.
7. INSTALL STEAM FLOW TRANSMITTER WITH 3 VALVE MANIFOLD, PROVIDED BY BOILER MANUFACTURER. INSTALL PER MANUFACTURERS INSTRUCTIONS.
8. INSTALL NEW 6" -300# ANGLE NON-RETURN VALVE PROVIDED BY BOILER MANUFACTURER..
9. INSTALL NEW 6" -300# STEAM STOP VALVE PROVIDED BY BOILER MANUFACTURER.
10. CONTRACTOR SHALL INSTALL PRESSURE RELIEF VALVES (2) PROVIDED BY BOILER MANUFACTURER IF NOT ALREADY INSTALLED.
11. SEE DETAIL D5/ME501 FOR RELIEF VALVE PIPING.
12. EXISTING 14" STEAM HEADER SHALL REMAIN.
13. NEW 6" STEAM SUPPLY PIPING FROM NEW BOILER.
14. EXISTING STEAM PIPING AND VALVE SHALL BE REUSED AS SHOWN.
15. EXISTING BOILER #3.
16. EXISTING BOILER #4.
17. 3/4" FREE BLOW DRAIN LINE. DRAIN VALVE SHALL BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY THIS CONTRACTOR FROM STEAM CONNECTION TO 3'-0" ABOVE FLOOR.
18. EXPANSION JOINT PROVIDED BY ECONOMIZER MANUFACTURER AND INSTALLED BY CONTRACTOR. COORDINATE WITH MANUFACTURER FOR EXACT LOCATION, SIZE, AND INSTALLATION INSTRUCTIONS.
19. NEW ECONOMIZER,ECONOMIZER INLET TRANSITION, AND ECONOMIZER OUTLET TRANSITION SHALL BE PROVIDED BY ECO THROUGH THE BOILER MANUFACTURER AND INSTALLED BY THIS CONTRACTOR. INSTALL PER MANUFACTURERS INSTRUCTIONS.
20. SEE LARGE SCALE DRAWING, SHEET ME201 FOR FUEL GAS RECIRCULATING DUCT AND CONNECTIONS.
21. EXISTING 6" STEAM PIPING FROM REMOVED BOILER #2; FROM MAIN STEAM HEADER TO VALVE SHALL REMAIN UNLESS PIPING AND VALVE ARE IN CONFLICT WITH THE INSTALLATION OF THE NEW ECONOMIZER AND STACK.
22. DROP TO EXISTING BLOWDOWN PIPING AND CONNECT TO EXISTING BLOWNDOWN LINE THAT WAS SERVING. REMOVE BOILER #2 SEE SHEET ME101 FOR CONTINUATION AND SHEET ME402 FOR LARGE SCALE OF BLOWDOWN SYSTEM.
23. NEW COEN BURNER. SEE LARGE SCALE PIPING PLAN ME201.
24. CONNECT 1-1/4" STEAM ATOMIZATION PIPE INTO 6" STEAM LINE FROM BOILER. ROUTE PIPING AS SHOWN.
25. DROP 1-1/4" ATOMIZATION STEAM LINE DOWN TO BURNER CONNECTION. SEE SHEET ME101 FOR CONTINUATION.
26. 1/2" CHEMICAL FEED PIPING. SEE SHEET ME101 FOR CONTINUATION.
27. DROP TO BLOW DOWN CONNECTION ON BOILER STEAM DRUM. SEE SHEET ME101 FOR CONTINUATION.
28. MINIMUM LENGTH OF STEAM PIPING FROM BOILER CONNECTION TO WEST ELL SHALL BE 9'-0".
29. EXISTING TOILET ROOM, STAIRS AND CATWALKS SHALL REMAIN.
30. 2" GAS VENT FROM BELOW OFF SET TO MISS STEAM PIPING AND ROUTE THRU ROOF. FIELD VERIFY ROUTING TO MISS STRUCTURAL, CONDUIT, PIPING ETC.
31. PROVIDE STEAM CONECTION FROM 6" STEAM SUPPLY TO BOILER AND ECONOMIZER SOOT BLOWERS. SIZING OF STEAM LINE TO SOOT BLOWERS SHALL BE PER SOOT BLOWER MANUFACTURER.
32. PROVIDE NEW HANDRAILS, TOE-PLATES ETC. FOR THIS AREA. SEE DETAIL C5/ME501.
33. CONNECT EXISTING EMERGENCY SHUT-OFF PUSH STATION TO NEW BOILER CONTROL PANEL.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Division of Facilities Construction & Management
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Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us


CONSULTANTS


WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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PROJECT MANAGER: SLW
DRAWN BY: LGD
CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

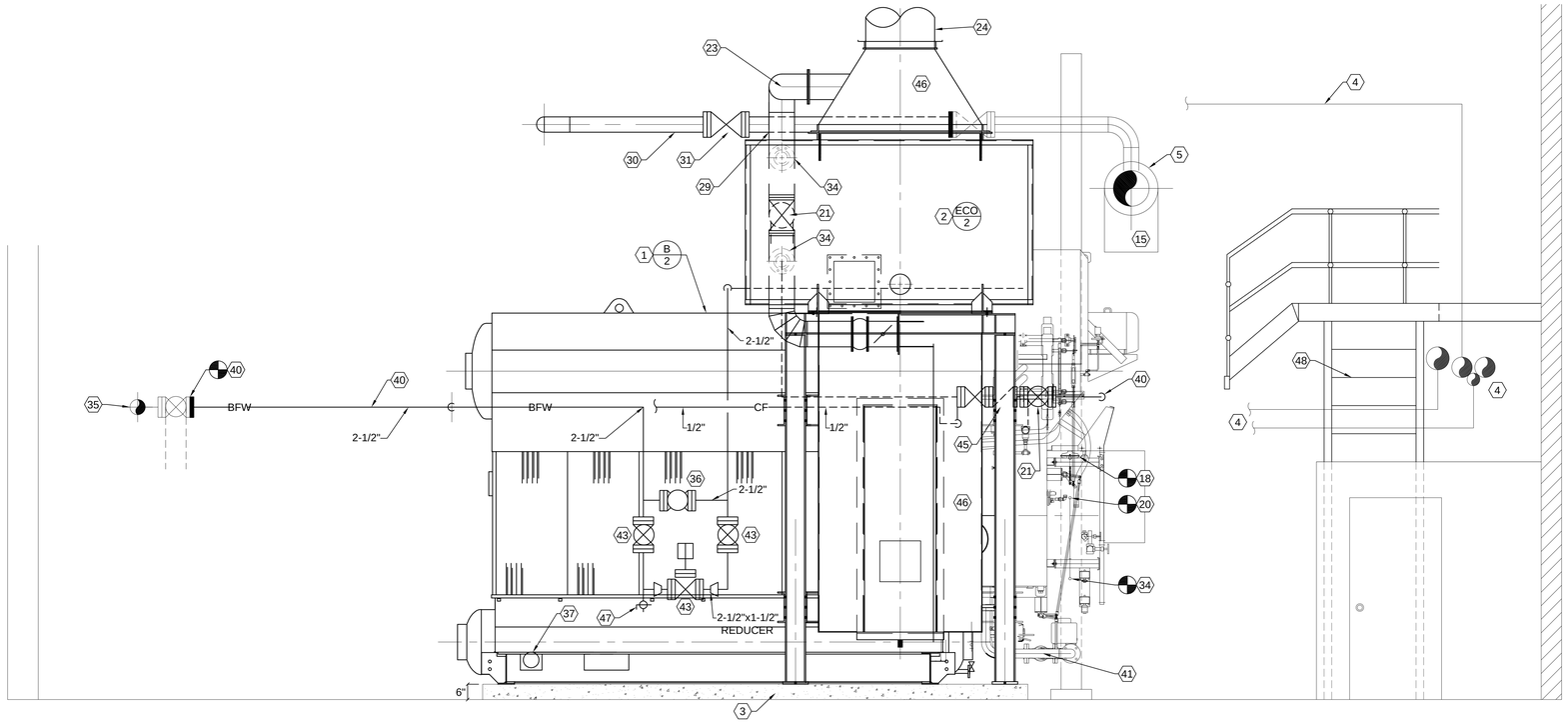
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

**UPPER LEVEL BOILER ROOM EQUIPMENT PLAN**

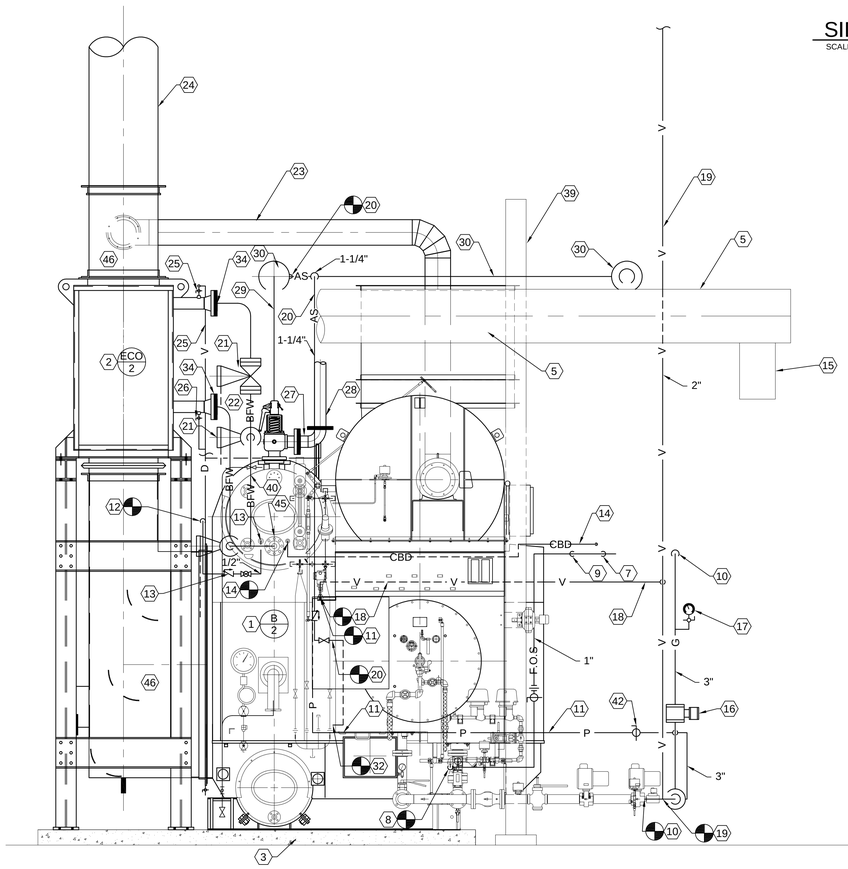
SHEET NO.

**ME102**




SIDE ELEVATION
SCALE: 1/2" = 1'-0"
C ME201






FRONT ELEVATION
SCALE: 1/2" = 1'-0"
A ME201



NOTES:

1. SEE SHEET ME703 FOR PIPING AND INSTRUMENTATION DIAGRAM AND SCHEDULE.
2. ALL VENTS AND DRAINS, NOT THRU ROOF SHALL BE BROUGHT DOWN TO DRAIN HEADERS OR FUNNELS IN A NEAT MANNER WITH THE ONE DRAIN ROUTED TO THE DRAIN TRENCH.

SHEET NOTES:

1. NEW 30,000 #1HR BOILER. PROVIDED BY OTHERS. CONTRACTOR SHALL UNLOAD BOILER AND INSTALL BOILER AS INDICATED.
2. NEW ECONOMIZER PROVIDED BY OTHERS. CONTRACTOR SHALL UNLOAD ECONOMIZER AND INSTALL AS INDICATED.
3. NEW BOILER FOUNDATION. SEE STRUCTURAL DRAWINGS FOR DETAILS.
4. EXISTING PIPING SHALL REMAIN.
5. EXISTING 14" STEAM HEADER SHALL REMAIN.
6. NEW 1-1/2" SCH. 80 FUEL OIL SUPPLY.
7. NEW 1-1/4" SCH. 80 FUEL OIL RETURN.
8. 1" SCH. 80 FUEL OIL SUPPLY TO CONNECTION ON BURNER. FIELD VERIFY ROUTING OF PIPING TO BURNER CONNECTION. PROVIDE 1" 600# BALL VALVE.
9. PROVIDE BACK PRESSURE VALVE. SEE SPECIFICATIONS.
10. NEW 3" NATURAL GAS. CONNECT TO GAS TRAIN PROVIDED WITH BOILER. CONTRACTOR SHALL INSTALL THE GAS TRAIN THAT WILL BE SHIPPED LOOSE WITH THE BOILER.
11. NEW 1/2" GAS PILOT LINE. CONNECT TO 3/8" GAS PILOT CONNECTION ON BURNER. FIELD VERIFY ROUTING OF PIPING TO BURNER CONNECTION.
12. NEW 1/2" CHEMICAL FEED PIPING. PROVIDE TRANSITION BETWEEN SCH. 80 PVC AND SCH. 80 CARBON STEEL AT THIS LOCATION.
13. INSTALL 1/2" 800# CHECK VALVE AND GATE VALVE PROVIDED BY BOILER MANUFACTURER. PROVIDE 1/2" 300# COMPANION FLANGE AT BOILER CONNECTION.
14. NEW 1" CONTINUOUS BLOWDOWN PIPING SCH. 80 CARBON STEEL. CONNECT TO BOILER CONNECTION WITH 1"- 300# COMPANION FLANGE.
15. EXISTING STEAM HEADER DRIP LEG SHALL REMAIN.
16. NEW NATURAL GAS METER. SEE SPECIFICATIONS.
17. NEW PRESSURE GAUGE.
18. NEW VENT PIPING FROM PILOT. FIELD VERIFY ROUTING OF VENT PIPING TO BURNER CONNECTION.
19. CONNECT NEW VENT PIPING CONNECTION ON GAS TRAIN. ROUTE GAS VENT UP AND THRU ROOF. FIELD VERIFY ROUTING OF VENT PIPING.
20. NEW 1-1/4" STEAM ATOMIZATION PIPING FROM NEW STEAM SUPPLY LINE. FIELD VERIFY ROUTING OF PIPING TO BURNER CONNECTION. USE SCH. 80 PIPING.
21. NEW 2-1/2" 300# GATE VALVES WITH CHAIN OPERATORS.
22. 3"x2-1/2" REDUCING ELL.
23. 10" DIA. FLUE GAS RECIRCULATING DUCT. PROVIDE BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR.
24. ROUTE STEEL STACK 17'-0" ABOVE ROOF WITH THREE GUY WIRES. SEE SPECIFICATION. PAINT STACK SAME COLOR AS EXISTING STACKS.
25. NEW 3/4" VENT CONNECTION AND VALVE. ROUTE DOWN THE SIDE OF THE BOILER AND TERMINATE WITH AN ADDITIONAL 3/4" 800# GATE VALVE. THE TOP 3/4" VALVE SHALL BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR. BOTTOM VALVE SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR. ALL PIPING SHALL BE SCH. 80.
26. NEW 3/4" DRAIN CONNECTION AND VALVE. ROUTE DOWN THE SIDE OF THE BOILER AND TERMINATE WITH AN ADDITIONAL 3/4" -800# GATE VALVE. THE 3/4" GATE VALVE SHALL BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR. BOTTOM VALVE SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR. ALL PIPING SHALL BE SCH. 80.
27. TWO NEW PRESSURE RELIEF VALVES PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR. MOUNT ON BOILER FLANGE CONNECTIONS. PROVIDE ONE - 4" 150# COMPANION FLANGE FOR RELIEF VALVE #1 AND ONE 3" - 150# COMPANION FLANGE FOR RELIEF VALVE #2.
28. PROVIDE DRIP PAN ELL AND DRAIN PAN DOWN THE SIDE OF THE BOILER AND TERMINATE IN HEADER WITH 3/4"- 800# GATE VALVE. SEE DETAIL D5/ME501.
29. PROVIDE 3/4" DRAIN BETWEEN 6" NON-RETURN ANGLE VALVE AND 6" STOP VALVE. ROUTE 3/4" SCH. 80 DRAIN DOWN THE SIDE OF THE BOILER AND TERMINATE WITH 3/4" - 800# FREE BLOWDOWN VALVE. VALVE SHALL BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR.
30. INSTALL NEW 6" STEAM PIPING FROM BOILER CONNECTION TO EXISTING 6" GATE VALVE USED FOR EXISTING REMOVED BOILER #1. SEE SHEET ME101. PIPING SHALL BE ASME CODE PIPING FROM BOILER CONNECTION TO 6" STOP VALVE.
31. CONTRACTOR SHALL INSTALL 6" - 300# ANGLE NON-RETURN VALVE AND 6" - 300# STOP VALVE PROVIDED BY BOILER MANUFACTURER. PROVIDE 6" - 300# COMPANION FLANGES AT BOILER CONNECTION AND AT VALVE CONNECTIONS.
32. CONDENSATE DRAIN FROM STEAM ATOMIZATION SYSTEM. ROUTE 3/4" SCH. 80 DRAIN LINE TO DRAINAGE SYSTEM.
33. PROVIDE UNIONS WHERE SHOWN AND AS APPLICABLE FOR ACCESS IN PIPING SYSTEM. UNIONS FOR STEAM, CONDENSATE, BOILER FEEDWATER, CHEMICAL FEET, BLOWDOWN, OIL SHALL BE SCH 80.
34. ECONOMIZER 3" - 300# INLET AND OUTLET CONNECTIONS. PROVIDE 3" - 300# COMPANION FLANGE AT NEW CONNECTION.
35. EXISTING 4" BOILER FEEDWATER SUPPLY.
36. 2-1/2"- 300# BY-PASS GLOBE VALVE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR.
37. NEW BLOWDOWN PIPING TO EXISTING BLOWDOWN PIPING IN EXISTING TRENCH. SEE DETAILS A2 AND C2/ME402. TANDEM VALVES SHALL BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR.
38. EXTEND 3/4" SOOT BLOWER DRAIN PIPING SIDE OF EXISTING BOILER AND TERMINATE WITH 3/4"- 800# GATE VALVE.
39. EXISTING 8x8 STEEL SUPPORT COLUMN.
40. CONNECT TO EXISTING 2-1/2"- 300# VALVE FOR NEW BOILER FEEDWATER PIPING PROVIDE 2-1/2"- 300# COMPANION FLANGE.
41. GAS TRAIN PROVIDED BY BOILER CONTRACTOR INSTALLED BY CONTRACTOR.
42. PILOT BALL VALVE.
43. BOILER FEEDWATER CONTROL VALVE, GATE VALVE ETC. SHALL BE PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR.
44. 3/4"- 800# DRAIN VALVE AND SCH. 80 PIPING.
45. NEW FEEDWATER GATE VALVE AND CHECK VALVE- 300# 2-1/2". PROVIDED BY BOILER MANUFACTURER AND INSTALLED BY CONTRACTOR.
46. ECONOMIZER INLET AND OUTLET TRANSITIONS PROVIDED BY ECONOMIZER MANUFACTURER AND INSTALLED BY CONTRACTOR.
47. LEAVE THIS PORTION OF CATWALK IN PLACE. SUPPORT FROM EXISTING POSTS AND PROVIDE NEW SUPPORT FROM EXISTING 8"x8" STEEL COLUMN.
48. EXISTING STAIRS AND LANDING SHALL REMAIN.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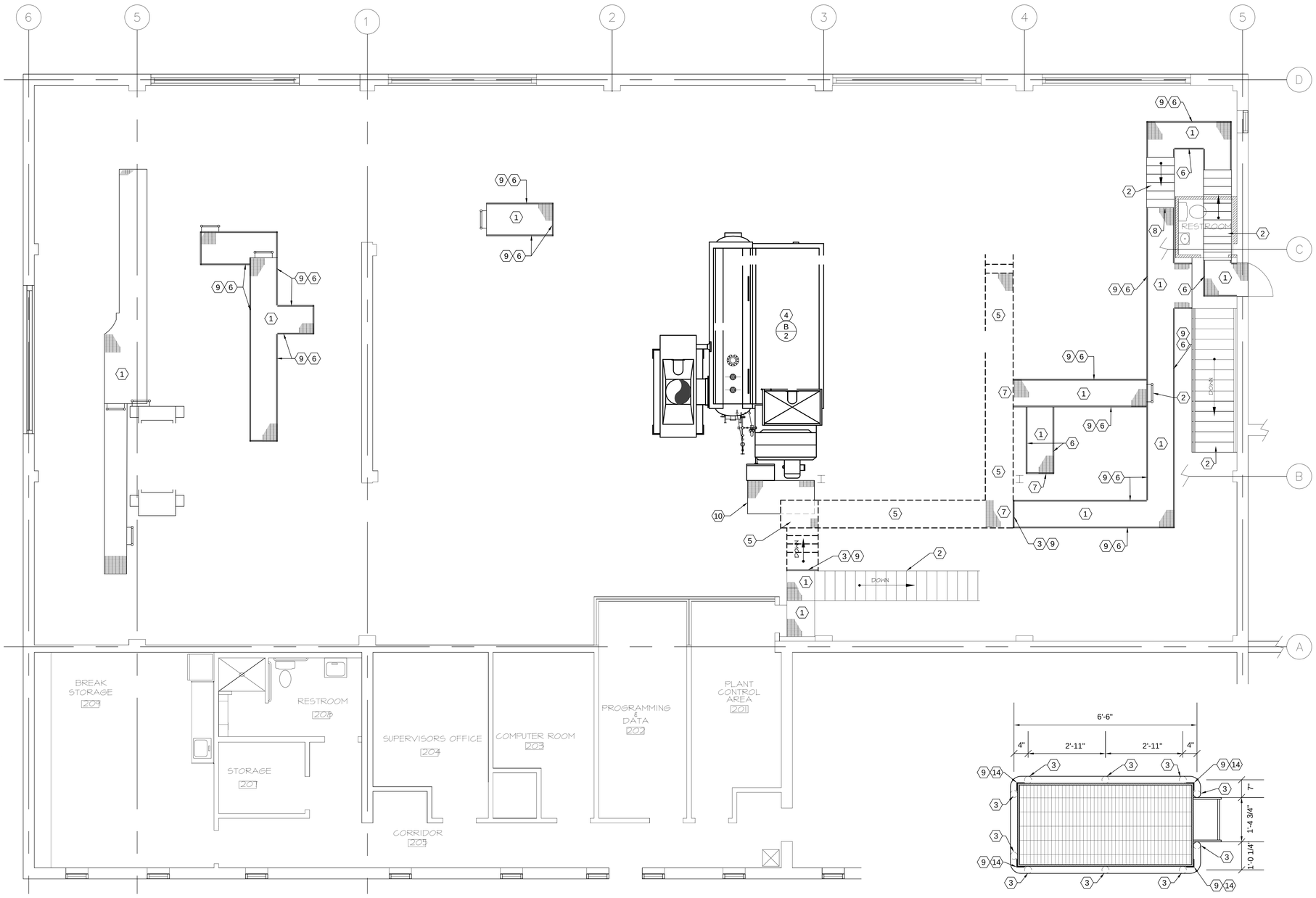
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

**BOILER ELEVATIONS**

SHEET NO.

**ME201**




CATWALK LAYOUT

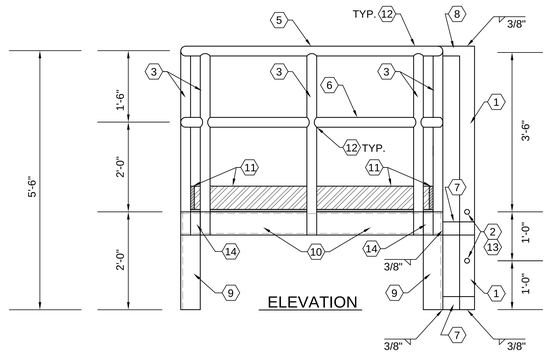
SCALE: 1/4" = 1'-0"

SHEET NOTES:

1. EXISTING CATWALK AND PLATFORMS SHALL REMAIN.
2. EXISTING STAIRS SHALL REMAIN.
3. PROVIDE NEW HANDRAIL TO BLOCK-OFF THIS AREA.
4. TEMPORARY ACCESS TO NEW BOILER #2. SEE DETAIL C5/ME501.
5. EXISTING CATWALK WAS REMOVED DURING DEMOLITION PHASE.
6. EXISTING CATWALK THAT WILL REMAIN SHALL BE FITTED WITH A 10 GA. FLAT STEEL TOE PLATE 6" HIGH.
7. PROVIDE TEMPORARY SUPPORT FOR THIS SIDE OF EXISTING CATWALK.
8. AT TOE PLATE AT BOTTOM O STAIRS EXTEND TOE PLATE ACROSS FIRST RISER PROVIDING 1/2" TO 1" NOSING.
9. REPLACE HANDRAILS ON EXISTING CATWALKS THAT ARE TO REMAIN. SEE DETAIL C5/ME501.
10. SEE DETAIL A4 THIS SHEET FOR BURNER ACCESS PLATFORM.




PLAN




ELEVATION

A4 FREE STANDING BURNER ACCESS PLATFORM

SCALE: NOT TO SCALE

ACCESS PLATFORM NOTES:

1. LADDER STRINGERS - 2"x3/8" BAR.
2. 3/4" DIA. RUNGS.
3. 1-1/2" DIA. PIPE - SCH. 40 POST SUPPORTS.
4. NON-SKID STEEL FLOOR SURFACE.
5. 1-1/2" DIA. PIPE - SCH. 40 POST.
6. 1-1/2" DIA. PIPE. SCH. 40 MID RAIL.
7. 4"x3/8" PLATE STL. WELD TO CHANNEL AND STRAINER.
8. 2"x3/8" PLATE STL. WELD TO TOP RAIL AND STRAINER.
9. 3"x3"x3/16" ANGLE.
10. 6"x2"x3/16" CHANNEL.
11. 6" - HIGH x 10 GA. FLAT STEEL TOE PLATE.
12. ALL HANDRAILS WELDS SHALL BE GROUND SMOOTH AND PAINTED PER OSHA AND WSU STANDARDS.
13. PUNCH HOLES IN LADDER STRINGERS AND WELD RUNGS TO STRINGERS ON OUTSIDE OF RUNGS AND GRIND SMOOTH.
14. WELD 3"x3"x$\frac{3}{16}$" ANGLE TO CHANNEL TYP. 4 LOCATIONS.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CONSULTANTS


WHW
ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com


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**DFCM No. 07049810**

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PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

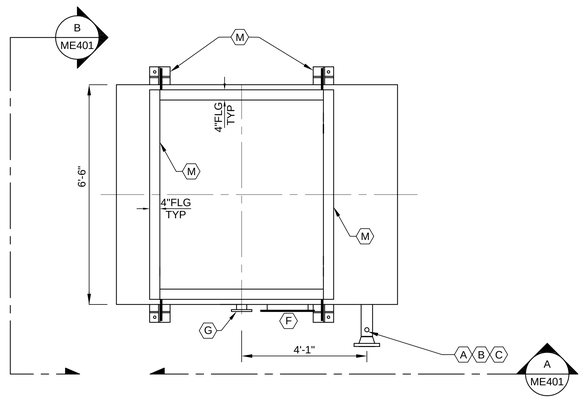
**CATWALK LAYOUT**

SHEET NO.

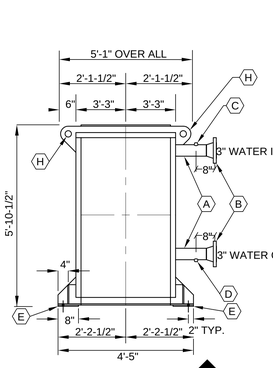
**ME202**

SHEET NOTES:

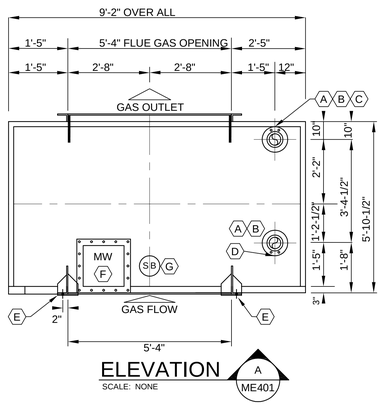
- (A) PIPE 3" SCH. 40 x SA-106-B-ASME CODE PIPE BY ECONOMIZER MANUFACTURER
- (B) FLANGE 3"-300# RFWN SCH. 40 BORE x SA-105 (NOTE: BOLT HOLES TO STRADDLE CENTERLINES)-BY ECONOMIZER MANUFACTURER.
- (C) VENT 1"-3000# THREDOLET W/PLUG x SA-105-BY ECONOMIZER MANUFACTURER.
- (D) DRAIN 1"-3000# THREDOLET W/PLUG x SA-105-BY ECONOMIZER MANUFACTURER.
- (E) 8"x8"x1/2" THK. SUPPORT PLATE BY ECONOMIZER MANUFACTURER.
- (F) 16"x16" MANWAY BY ECONOMIZER MANUFACTURER.
- (G) SOOT BLOWER WALL BOX AND DISTAL BEARING BY ECONOMIZER MANUFACTURER.
- (H) 2-1/2"Ø LIFTING EYE TYPICAL OF 4 - BY ECONOMIZER MANUFACTURER.
- (I) SEE SHEET ME201 FOR BOILER AND ECONOMIZER ARRANGEMENT AND PIPING.
- (J) CONNECTION TO BOILER FLUE OUTLET BY CONTRACTOR.
- (K) ONE PIECE 10 GA. OUTLET TRANSITION WITH 10" FLANGED CONNECTION FOR FUEL GAS RECIRCULATION. PROVIDED BY ECONOMIZER MANUFACTURER AND INSTALLED BY CONTRACTOR.
- (L) ONE PIECE 10 GA. INLET TRANSITION WITH EXPANSION JOINT. PROVIDED BY ECONOMIZER MANUFACTURER AND INSTALLED BY CONTRACTOR.
- (M) PLATES, STRUCTURAL COLUMNS, PADS, ETC. PROVIDED BY ECONOMIZER MANUFACTURER AND INSTALLED BY CONTRACTOR.
- (N) 2" DRAIN PROVIDED BY ECONOMIZER MANUFACTURER. CONTRACTOR SHALL PROVIDE 2" DRAIN AND DRAIN VALVE. 800# S.W.
- (O) EXPANSION JOINT PROVIDED BY ECONOMIZER MANUFACTURER AND INSTALLED BY CONTRACTOR.
- (P) NEW CONCRETE BASE. SEE STRUCTURAL DRAWINGS SB101 AND SB401.
- (Q) COORDINATE THIS DIMENSION WITH STRUCTURAL DRAWINGSD FOR NEW PAD.




PLAN VIEW
SCALE: NONE

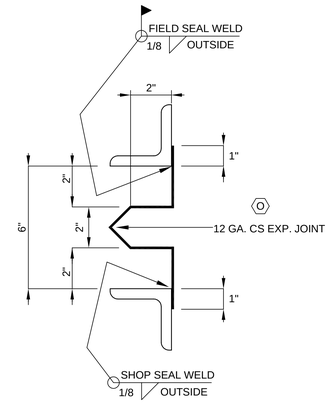



ELEVATION B ME401
SCALE: NONE

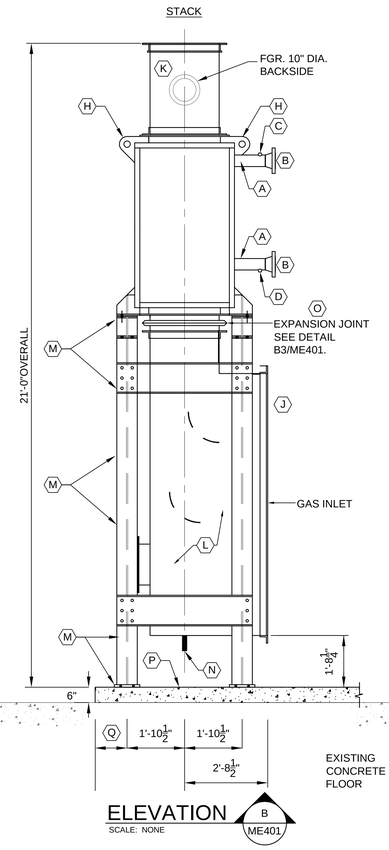



ELEVATION A ME401
SCALE: NONE

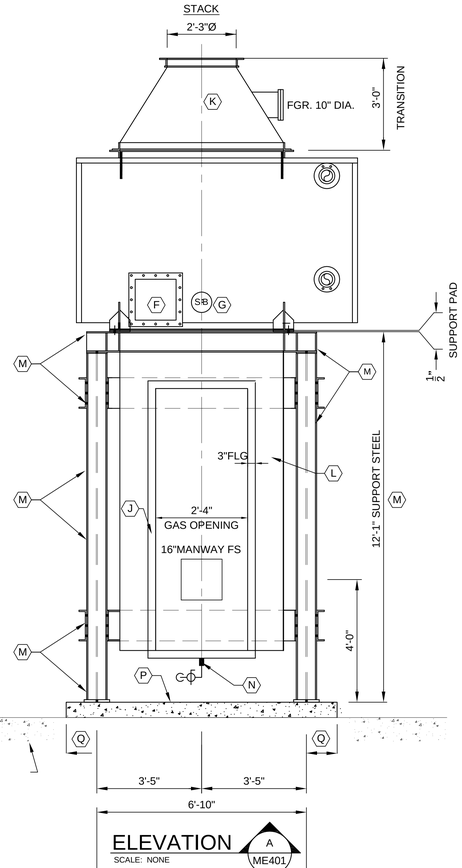
## B1 ECONOMIZER PLAN AND ELEVATIONS
SCALE: NONE



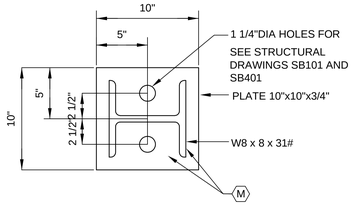

## B3 EXPANSION JOINT SECTION
SCALE: NONE



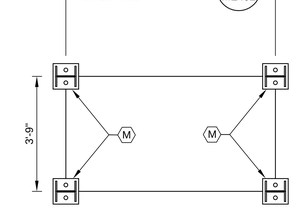

ELEVATION B ME401
SCALE: NONE




ELEVATION A ME401
SCALE: NONE




## A4 ENLARGED BASE PLATE DETAIL
SCALE: NONE




## A5 ANCHOR BOLT & COLUMN PLAN
SCALE: NONE

## LARGE SCALE ECONOMIZER ARRANGEMENT
SCALE: NONE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4110 State Office Building
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CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
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SANDY, UTAH 84070
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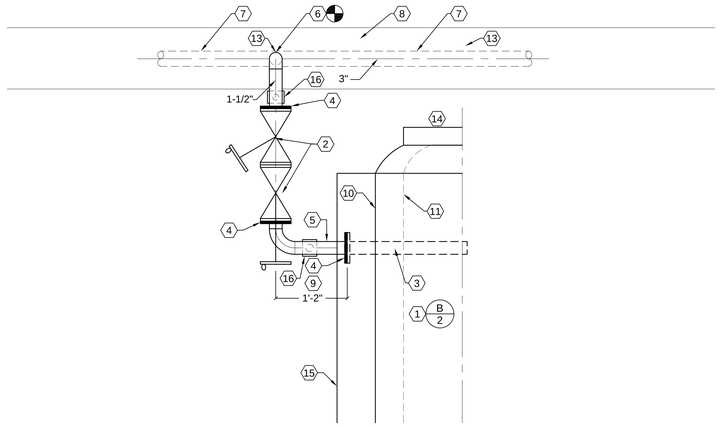
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE
**LARGE SCALE ECONOMIZER ARRANGEMENT**

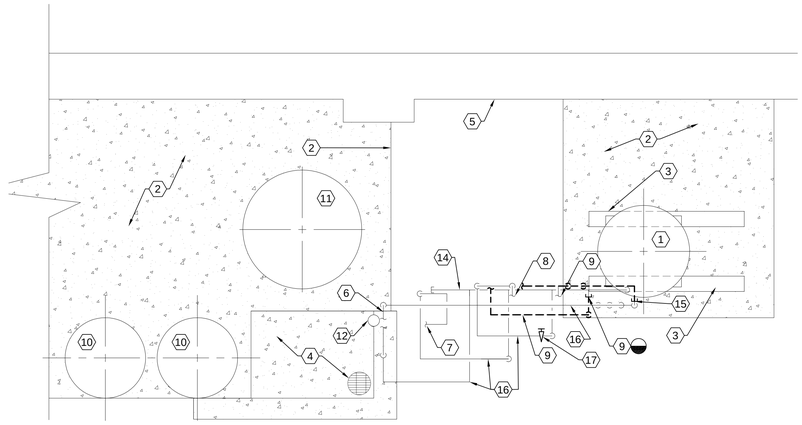
SHEET NO.
**ME401**

INTERMITTEN BLOWDOWN NOTES:

1. NEW 30,000 #/HR STEAM BOILER.
2. LOWER DRUM BLOWOFF TANDEM VALVES PROVIDED BE B&W INSTALLED BY THIS CONTRACTOR.
3. 1-1/2" BLOWDOWN PIPING TO FLANGE PROVIDED WITH BOILER.
4. NEW 1-1/2" -300# COMPANION FLANGES.
5. ASME CODE PIPING BETWEEN FLANGES AND FIRST VALVE. WELD ALL JOINTS.
6. CONNECT TO EXISTING 3" DIA. BLOWDOWN PIPING IN EXISTING TRENCH.
7. EXISTING 3" DIA. BLOWDOWN PIPING IN TRENCH..
8. EXISTING FLOOR TRENCH. SEE DETAIL D3/ME501.
9. 1'-2" FIELD VERIFY.
10. STEAM DRUM.
11. LOWER MUD DRUM.
12. NEW BOILER CONCRETE PAD. SEE STRUCTURAL DETAILS ON STRUCTURAL DRAWINGS.
13. FIELD VERIFY DEPTH OF TRENCH AT NEW CONNECTION LOCATION.
14. BOILER DRUM ACCESS MANWAY.
15. EXTERIOR EDGE OF BOILER.
16. FLOOR SUPPORTS MADE FROM 2" DIA. PIPE AND 4"x4"x1/4" FLOOR PLATE WITH TWO BOLTS. SEE DETAIL A1/ME501



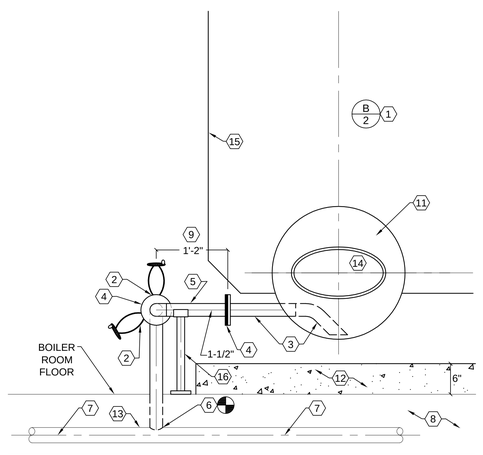

C2 BLOWDOWN PIPING PLAN
SCALE: 1" = 1'-0"



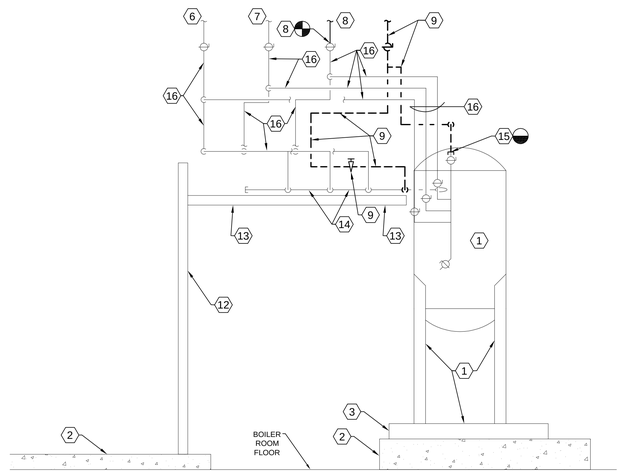
C4 RENOVATED CONTINUOUS BLOWDOWN PIPING PLAN
SCALE: 3/4" = 1'-0"

CONTINUOUS BLOWDOWN NOTES:

1. EXISTING NIPPER, BLOWDOWN TANK, AND SUPPORTS SHALL REMAIN.
2. EXISTING CONCRETE PAD SHALL REMAIN.
3. 4X4 SUPPORT CHANNELS SHALL REMAIN.
4. EXISTING SUMP AND DRAIN SHALL REMAIN.
5. EXISTING EXTERIOR WALL.
6. CONTINUOUS BLOWDOWN FROM BOILER B-4 SHALL REMAIN.
7. CONTINUOUS BLOWDOWN FROM BOILER B-3 SHALL REMAIN .
8. CONTINUOUS BLOWDOWN FROM EXISTING BOILER B-2 SHALL BE REMOVED TO VALVE AND REPIPED AS SHOWN TO NEW BOILER B-2 ON SHEET ME101.
9. CONTINUOUS BLOWDOWN FROM EXISTING BOILER B-1 SHALL BE REMOVED TO HEADER TAKE-OFF AND CAPPED.
10. EXISTING SOFTENER TANKS SHALL REMAIN.
11. INTERMITTEN LOWER DRUM BLOWDOWN TANK SHALL REMAIN.
12. EXISTING 2" DIA. STEEL PIPE SUPPORT SHALL REMAIN.
13. EXISTING 1-1/2"x1-1/2" UNISTRUT SHALL REMAIN.
14. EXISTING BLOWDOWN HEADER SHALL REMAIN.
15. PROVIDE 1/2" NIPPLE AND CAP AT VALVE.
16. ALL EXISTING PIPING, VALVES, SUPPORTS ETC. SHALL REMAIN.
17. REMOVE AND REPLACE NEEDLE VALVE INTO EXISTING PIPING SERVING THE NEW BOILER #2. NEEDLE VALVE SHALL BE EQUAL TO.




A2 BLOWDOWN PIPING ELEVATION
SCALE: 1" = 1'-0"




A4 RENOVATED CONTINUOUS BLOWDOWN PIPING ELEVATION
SCALE: 3/4" = 1'-0"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4110 State Office Building
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Phone: (801) 538 - 3018
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Internet: http://www.dfcm.state.ut.us


CONSULTANTS


WHW
ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
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PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

PROJECT MANAGER: SLW
DRAWN BY: LGD
CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

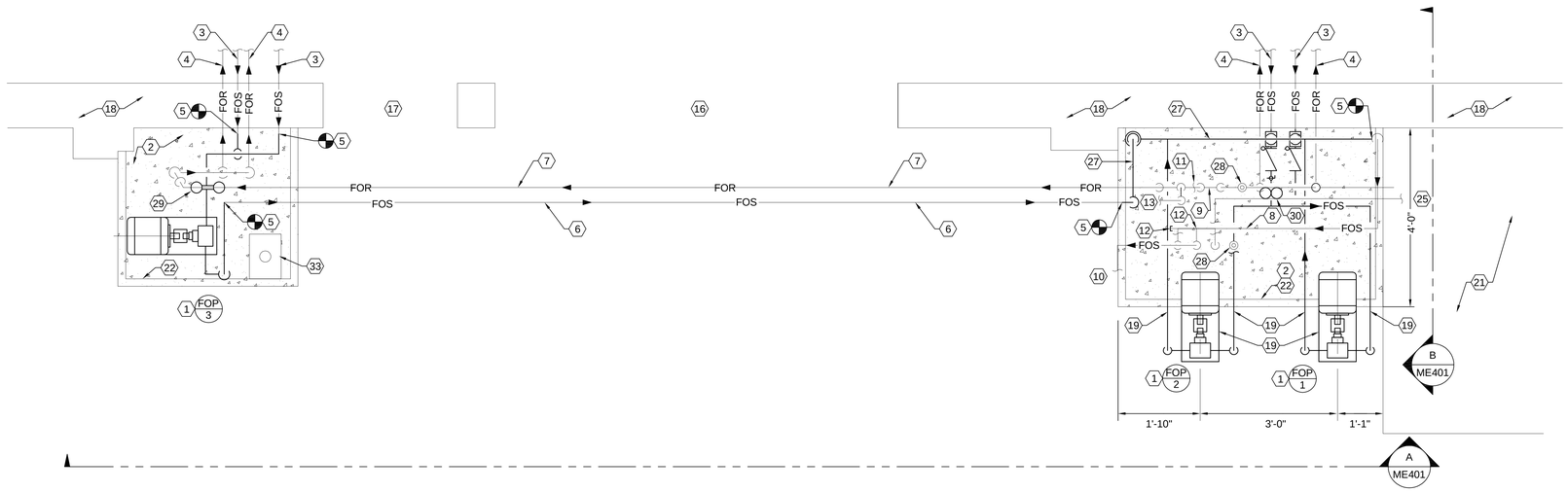
PROFESSIONAL ENGINEER
04/11/08
WINWARD M. PACKER
No. 375080
STATE OF UTAH

SHEET TITLE

**LARGE SCALE PLANS AND ELEVATIONS BLOWDOWN SYSTEMS**

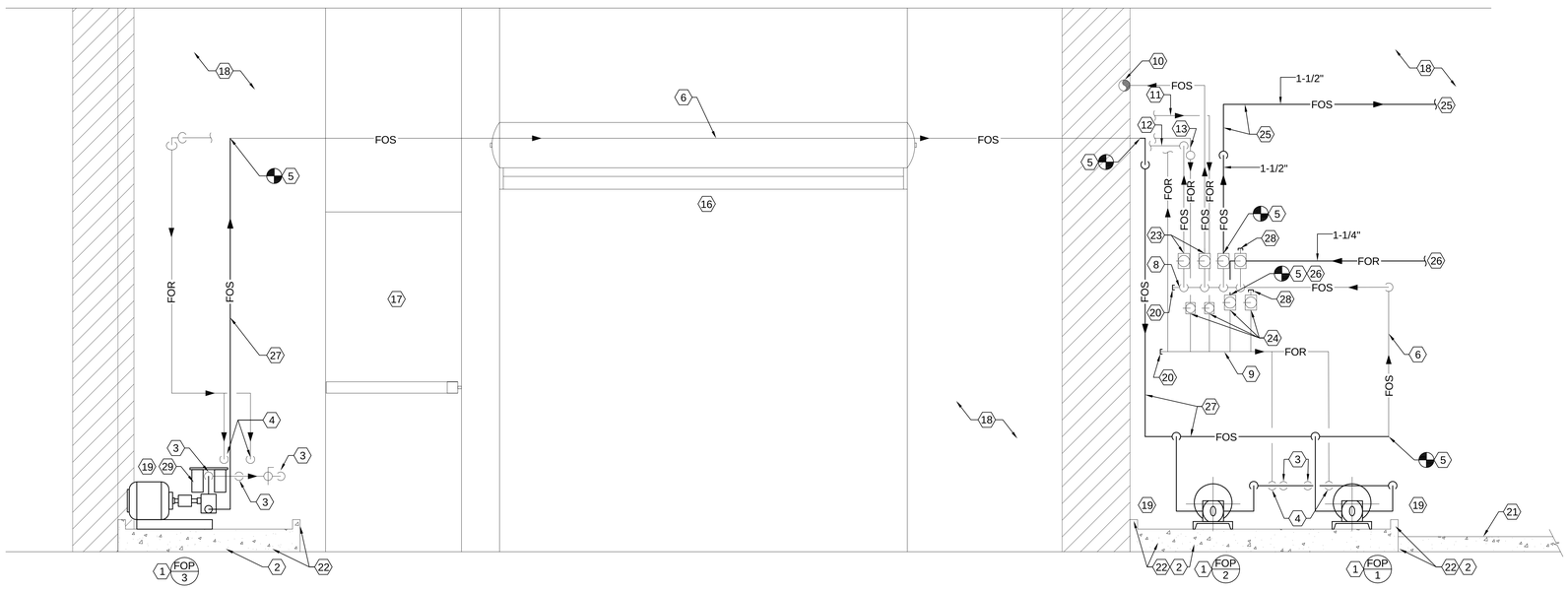
SHEET NO.

**ME402**



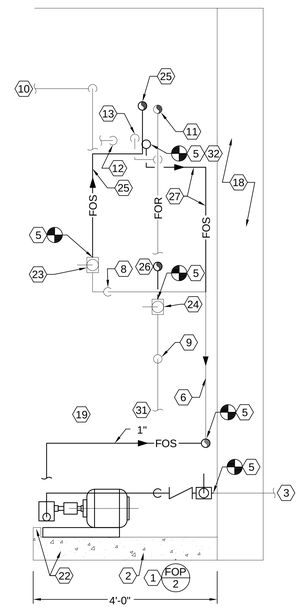

C3 LARGE SCALE PLAN VIEW FUEL OIL PIPING

SCALE: 3/4" = 1'-0"




A3 LARGE SCALE ELEVATION FUEL OIL PIPING

SCALE: 3/4" = 1'-0"




ELEVATION

SCALE: NONE

SHEET NOTES:

1. REMOVE EXISTING FUEL OIL PUMPS AND REPLACE WITH NEW FUEL OIL PUMPS FOP-1,2 AND 3. SEE SCHEDULE SHEET ME601.
2. REMOVE EXISTING PUMP BASES AND REPLACE WITH NEW PUMP CONCRETE PAD AS INDICATED. SEE DETAIL C3 SHEET ME501.
3. EXISTING FUEL OIL SUPPLY FROM UNDERGROUND STORAGE TANKS.
4. EXISTING FUEL OIL RETURN TO UNDERGROUND STORAGE TANKS.
5. CONNECT NEW PIPING TO EXISTING AT THIS LOCATION. FIELD VERIFY EXACT LOCATION.
6. EXISTING FUEL OIL SUPPLY SHALL REMAIN.
7. EXISTING FUEL OIL RETURN SHALL REMAIN.
8. EXISTING FUEL OIL SUPPLY HEADER SHALL REMAIN.
9. EXISTING FUEL OIL RETURN HEADER SHALL REMAIN.
10. EXISTING FUEL OIL SUPPLY TO BOILER #3 SHALL REMAIN.
11. EXISTING FUEL OIL RETURN FROM BOILER #3 SHALL REMAIN.
12. EXISTING FUEL OIL SUPPLY TO BOILER #4 SHALL REMAIN.
13. EXISTING FUEL OIL RETURN FROM BOILER #4 SHALL REMAIN.
14. REMOVE EXISTING FUEL OIL SUPPLY PIPING ETC. TO BOILER #1
15. REMOVE EXISTING FUEL OIL SUPPLY PIPING.
16. EXISTING 9'-0" ROLL-UP DOOR.
17. EXISTING 3'-0" MAN-DOOR.
18. WEST EXTERIOR WALL.
19. SEE FUEL OIL PUMP PIPING VALVES ETC. SHEET ME701.
20. PROVIDE PIPE CAP AT END OF HEADER.
21. EXISTING WATER SOFTENER PAD.
22. NEW 6" HIGH CONCRETE PAD FOR NEW OIL PUMPS. SEE DETAIL C3/ME501. PROVIDE A 1-1/2" HIGH BY 2" WIDE CURB FOR CONTAINMENT.
23. EXISTING F.O.S. VALVES SHALL REMAIN.
24. EXISTING F.O.R. VALVES SHALL REMAIN.
25. PROVIDE NEW 1-1/2" F.O.S. TO NEW BOILER #2. FOLLOW SAME ROUTING AS REMOVED PIPING. SUPPORT FROM WALL.
26. PROVIDE NEW 1-1/4" F.O.R. FROM NEW BOILER #2 BACK TO EXISTING VALVE.
27. PROVIDE NEW 1-1/2" F.O.S. FROM FOP-3 TO SUPPLY HEADER.
28. PROVIDE CAP AT VALVE OUTLET FOR BOTH FUEL OIL SUPPLY AND RETURN SERVING REMOVED BOILER #1.
29. PROVIDE NEW DUAL BASKET STRAINER.
30. PUMPS HAVE NOT BEEN SHOWN ON THE NEW PAD FOR CLARITY OF PIPING. CONTRACTOR SHALL MOUNT THE NEW PUMPS ON NEW PAD IN ACTUAL INSTALLATION.
31. EXISTING F.O.R. PIPING TO TANKS.
32. 1-1/2" F.O.S. FROM NEW F.O.P-3
33. EXISTING PIPE SUPPORT SHALL REMAIN.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PROFESSIONAL MECHANICAL ENGINEERING
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SANDY, UTAH 84070
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**DFCM No. 07049810**

Ogden, Utah

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CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

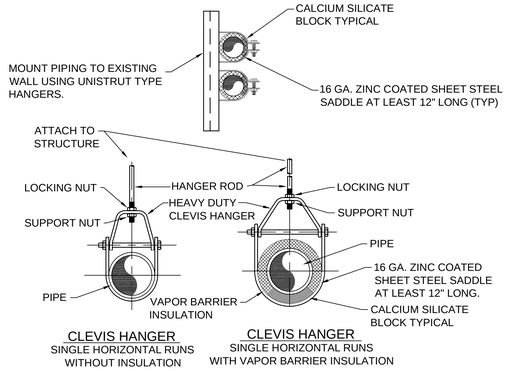
**LARGE SCALE FUEL OIL PLAN VIEW AND ELEVATIONS**

SHEET NO.

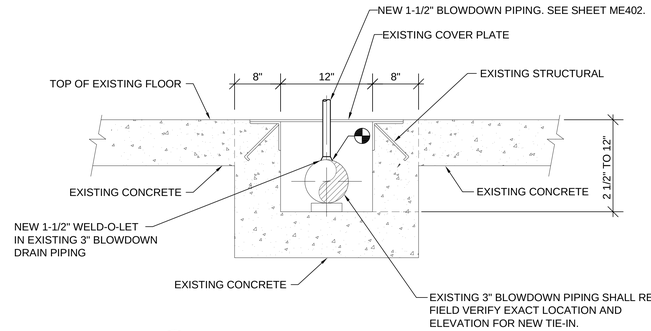
**ME403**

NOTE:

1. WHEN HANGER RODS ARE LOCATED WHERE THERE ARE NOT STEEL SUPPORTS DIRECTLY ABOVE THE RODS. CONTRACTOR SHALL SPAN BETWEEN JOISTS WITH 2x2x1/4" ANGLES BACK TO BACK WITH RODS LOCATED BETWEEN THE ANGLES.
2. TRAPEZE HANGERS ARE ALSO APPROVED FOR USE WHERE MULTIPAL PIPES ARE ROUTED NEXT TO EACH OTHER AT THE SAME ELEVATIONS. SEE SPECIFICATIONS.

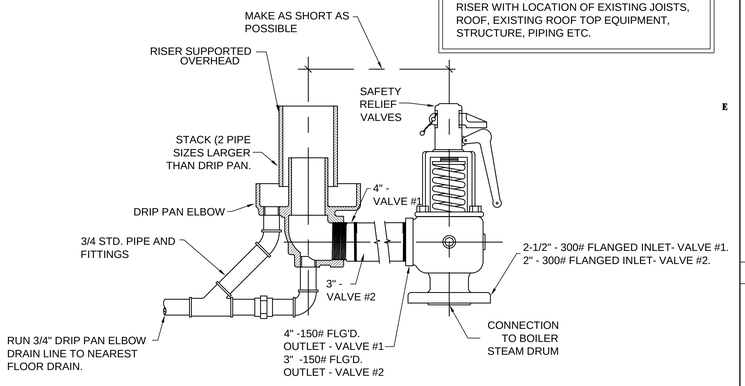



C1 PIPE HANGER DETAIL
SCALE: NONE

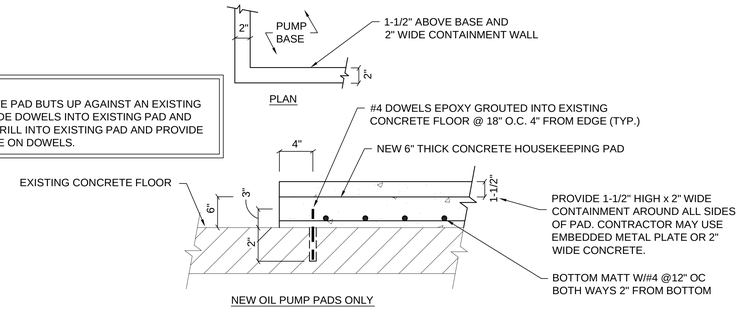



D3 EXISTING TRENCH SECTION DETAIL.
SCALE: NONE

NOTE:
COORDINATE ROOF PENETRATION AND PIPE RISER WITH LOCATION OF EXISTING JOISTS, ROOF, EXISTING ROOF TOP EQUIPMENT, STRUCTURE, PIPING ETC.



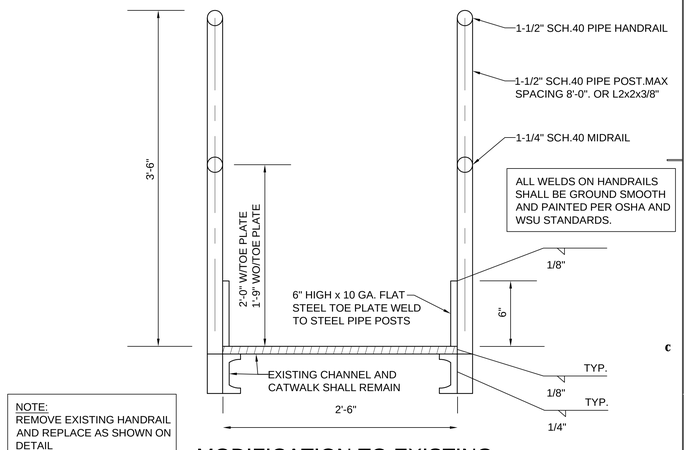

D5 SAFETY VALVE DETAIL
SCALE: NONE




NOTE:
IF CONCRETE PAD BUTS UP AGAINST AN EXISTING PAD, PROVIDE DOWELS INTO EXISTING PAD AND NEW PAD. DRILL INTO EXISTING PAD AND PROVIDE EPOXY GLUE ON DOWELS.

NEW OIL PUMP PADS ONLY

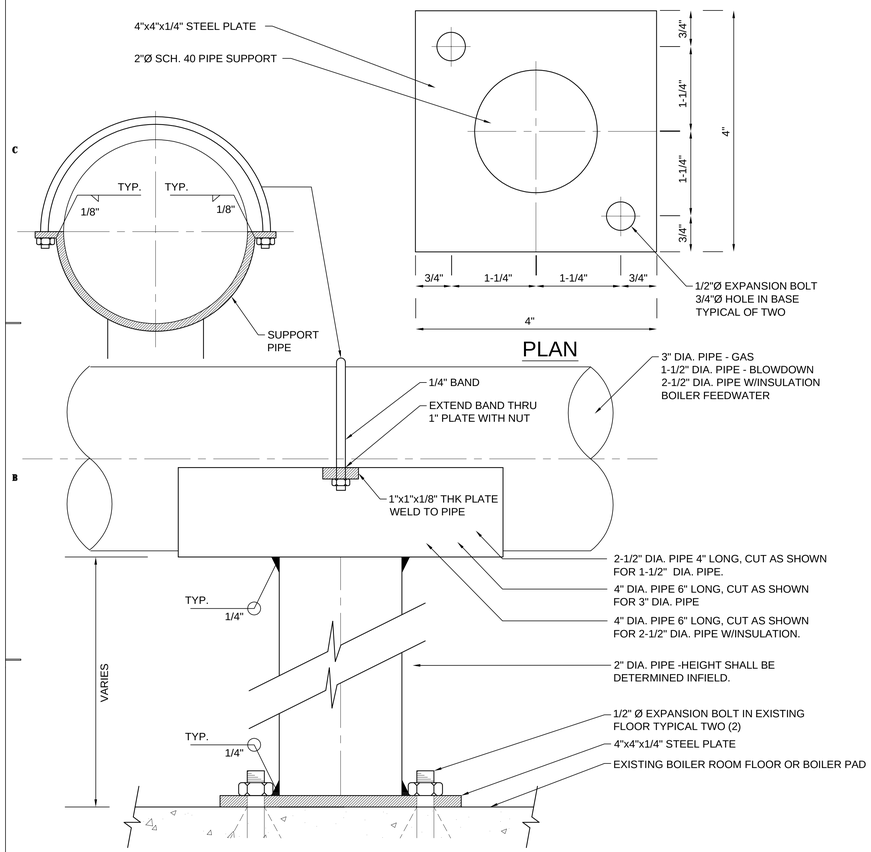
C3 CONCRETE HOUSEKEEPING PUMP BASE
SCALE: NONE



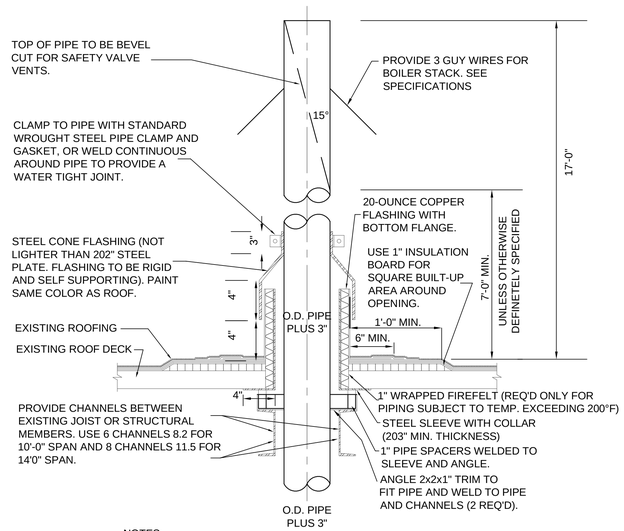

NOTE:
REMOVE EXISTING HANDRAIL AND REPLACE AS SHOWN ON DETAIL

MODIFICATION TO EXISTING REMAINING CATWALK AND HANDRAILS

C5
SCALE: NONE

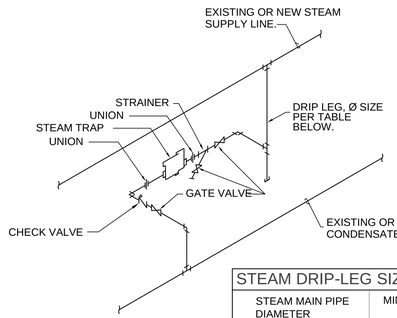



A1 FLOOR PIPING SUPPORT DETAIL
SCALE: NONE




NOTES:
1. PIPING CONTRACTOR SHALL CUT OUT REQUIRED OPENING IN EXISTING ROOF AND REPAIR ROOFING IN A MANNER APPROVED BY ENGINEER UNTIL NEW ROOF IS INSTALLED UNDER A DIFFERENT CONTRACT. SEE STRUCTURAL DRAWINGS.

A3 FLASHING FOR PIPES AND VENT THROUGH EXISTING ROOF DETAIL.
SCALE: NONE




STEAM DRIP-LEG SIZING TABLE

| STEAM MAIN PIPE DIAMETER | MINIMUM DIAMETER OF DRIP LEG |
|---|---|
| 6" | 4" |
| 4" | 3" |
| 3" | 3" |
| 2" | 2" |

A5 STEAM TRAP DETAIL
SCALE: NONE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Salt Lake City, Utah 84114
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CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

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PROJECT MANAGER: SLW
DRAWN BY: LGD
CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE
**MECHANICAL DETAILS**

SHEET NO.
**ME501**

## BOILER SCHEDULE

| | SYMBOL | DESIGN CAPACITY | DESIGN PRESSURE | OPERATING PRESSURE | FURNACE VOL. (CU. FT.) | TYPE | BOILER CONVECTION HEATING (SQ. FT.) | FURNACE HEATING SURFACE (SQ. FT.) | ASME TOTAL BOILER HEATING SURFACE SQ. FT. | FORCED DRAFT FAN MOTOR HP | WEIGHT LBS. | | | MAKE AND MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | EMPTY | HYDRO | OPERATIONAL | |
| | B-1 | REMOVED | | | | | | | | | | | | |
| | B-2 | REMOVED | | | | | | | | | | | | |
| *NEW* | B-2 | 30,000 LBS./HR | 250 PSIG | 125 PSIG | 633 | D | 2071 | 432 | 2503 | 25 | 47,500 | 62,600 | 58,400 | B & W FM9-48 RH |
| | B-3 | EXISTING | | | | | | | | | | | | |
| | B-4 | EXISTING | | | | | | | | | | | | |

1. BOILER IS FITTED WITH A COEN BURNER MODEL 760, DNX - 20.
2. PROVIDE 120V CONTROL CIRCUIT.
3. PROVIDE SERVICE FOR 40 HP FAN MOTOR.

NOTES:

BOILER IS BEING PURCHASED BY THE STATE OF UTAH. CONTRACTOR SHALL BE RESPONSIBLE FOR UNLOADING AND INSTALLATION. SEE SHEET ME703 FOR SCHEDULE

## FUEL OIL PUMP SCHEDULE

| SYMBOL | TYPE | MAKE / MODEL | GPM | P.S.I. | SUCTION SIZE | DISCHARGE SIZE | MOTOR | | | SERVICE | SCHEDULE NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V - Ø - Hz | HP | RPM | | |
| FOP-1 | ROTARY POSITIVE DISPLACEMENT | INGERSOLL DRESSER MODEL 4GASMIDO | 15 | 150 | 1" | 1" | 208/3/60 | 3 | 1800 | #2 FUEL OIL | |
| FOP-2 | ROTARY POSITIVE DISPLACEMENT | INGERSOLL DRESSER MODEL 4GASMIDO | 15 | 150 | 1" | 1" | 208/3/60 | 3 | 1800 | #2 FUEL OIL | |
| FOP-3 | ROTARY POSITIVE DISPLACEMENT | INGERSOLL DRESSER MODEL 4GASMIDO | 15 | 150 | 1" | 1" | 208/3/60 | 3 | 1800 | #2 FUEL OIL | |

1. SEE SPECIFICATIONS FOR OTHER APPROVED MANUFACTURERS.
2. PUMPS SHALL BE USED FOR PUMPING #2 FUEL OIL.

## BOILER ECONOMIZER SCHEDULE

| SYMBOL | FLUE GAS FLOW RATE ACFM | HEATING SURFACE SQ. FT | DESIGN | | RATED HEAT ABSORPTION BTUH | FOULING FACTOR | | OPERATING PRESSURE | | MANUFACTURER |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | TEMPERATURE | PRESSURE | | TUBE | SHELL | TUBE PSI. | SHELL PSI. | |
| ECO-2 | - | 1579 | 700 DEG. F | 250 PSI | 1,421,028 | .00100 | .0020 | 150 | - | ECO-INC (1) |

1. ECONOMIZER IS BEING PURCHASED BY THE STATE OF UTAH. CONTRACTOR SHALL BE RESPONSIBLE FOR UNLOADING AND INSTALLATION. SEE SHEET ME703 FOR SCHEDULE.


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Department of Administrative Services
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4110 State Office Building
Salt Lake City, Utah 84114
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CONSULTANTS


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PROFESSIONAL MECHANICAL ENGINEERING
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SANDY, UTAH 84070
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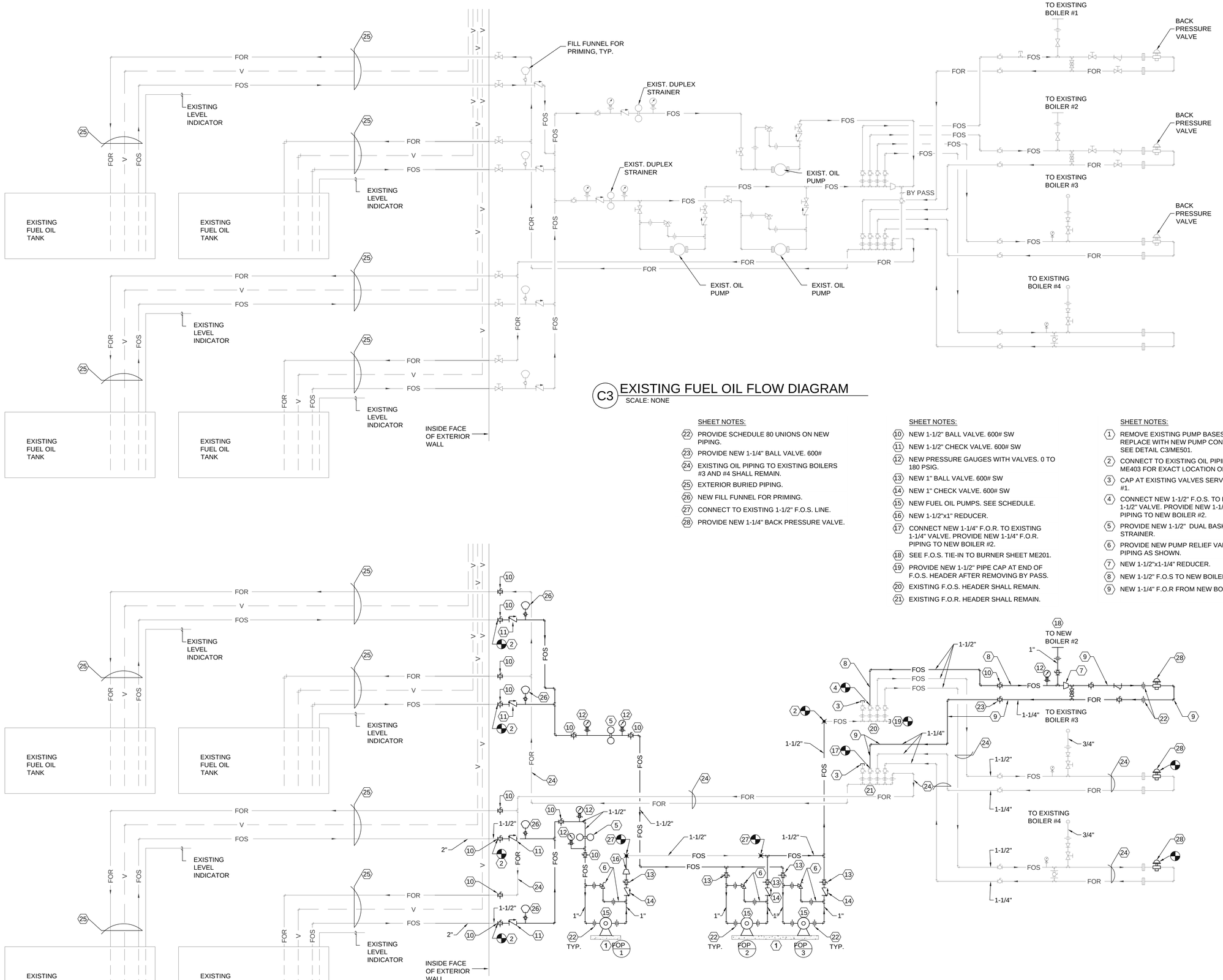
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

**MECHANICAL SCHEDULES**

SHEET NO.

**ME601**




## C3 EXISTING FUEL OIL FLOW DIAGRAM

SCALE: NONE

SHEET NOTES:

22. PROVIDE SCHEDULE 80 UNIONS ON NEW PIPING.
23. PROVIDE NEW 1-1/4" BALL VALVE. 600#
24. EXISTING OIL PIPING TO EXISTING BOILERS #3 AND #4 SHALL REMAIN.
25. EXTERIOR BURIED PIPING.
26. NEW FILL FUNNEL FOR PRIMING.
27. CONNECT TO EXISTING 1-1/2" F.O.S. LINE.
28. PROVIDE NEW 1-1/4" BACK PRESSURE VALVE.

SHEET NOTES:

10. NEW 1-1/2" BALL VALVE. 600# SW
11. NEW 1-1/2" CHECK VALVE. 600# SW
12. NEW PRESSURE GAUGES WITH VALVES. 0 TO 180 PSIG.
13. NEW 1" BALL VALVE. 600# SW
14. NEW 1" CHECK VALVE. 600# SW
15. NEW FUEL OIL PUMPS. SEE SCHEDULE.
16. NEW 1-1/2"x1" REDUCER.
17. CONNECT NEW 1-1/4" F.O.R. TO EXISTING 1-1/4" VALVE. PROVIDE NEW 1-1/4" F.O.R. PIPING TO NEW BOILER #2.
18. SEE F.O.S. TIE-IN TO BURNER SHEET ME201.
19. PROVIDE NEW 1-1/2" PIPE CAP AT END OF F.O.S. HEADER AFTER REMOVING BY PASS.
20. EXISTING F.O.S. HEADER SHALL REMAIN.
21. EXISTING F.O.R. HEADER SHALL REMAIN.

SHEET NOTES:

1. REMOVE EXISTING PUMP BASES AND REPLACE WITH NEW PUMP CONCRETE PAD. SEE DETAIL C3/ME501.
2. CONNECT TO EXISTING OIL PIPING. SEE ME403 FOR EXACT LOCATION OF TIE-IN.
3. CAP AT EXISTING VALVES SERVING BOILER #1.
4. CONNECT NEW 1-1/2" F.O.S. TO EXISTING 1-1/2" VALVE. PROVIDE NEW 1-1/2" F.O.S. PIPING TO NEW BOILER #2.
5. PROVIDE NEW 1-1/2" DUAL BASKET STRAINER.
6. PROVIDE NEW PUMP RELIEF VALVE AND PIPING AS SHOWN.
7. NEW 1-1/2"x1-1/4" REDUCER.
8. NEW 1-1/2" F.O.S TO NEW BOILER #2.
9. NEW 1-1/4" F.O.R FROM NEW BOILER #2.




## A3 NEW FUEL OIL FLOW DIAGRAM

SCALE: NONE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SANDY, UTAH 84070
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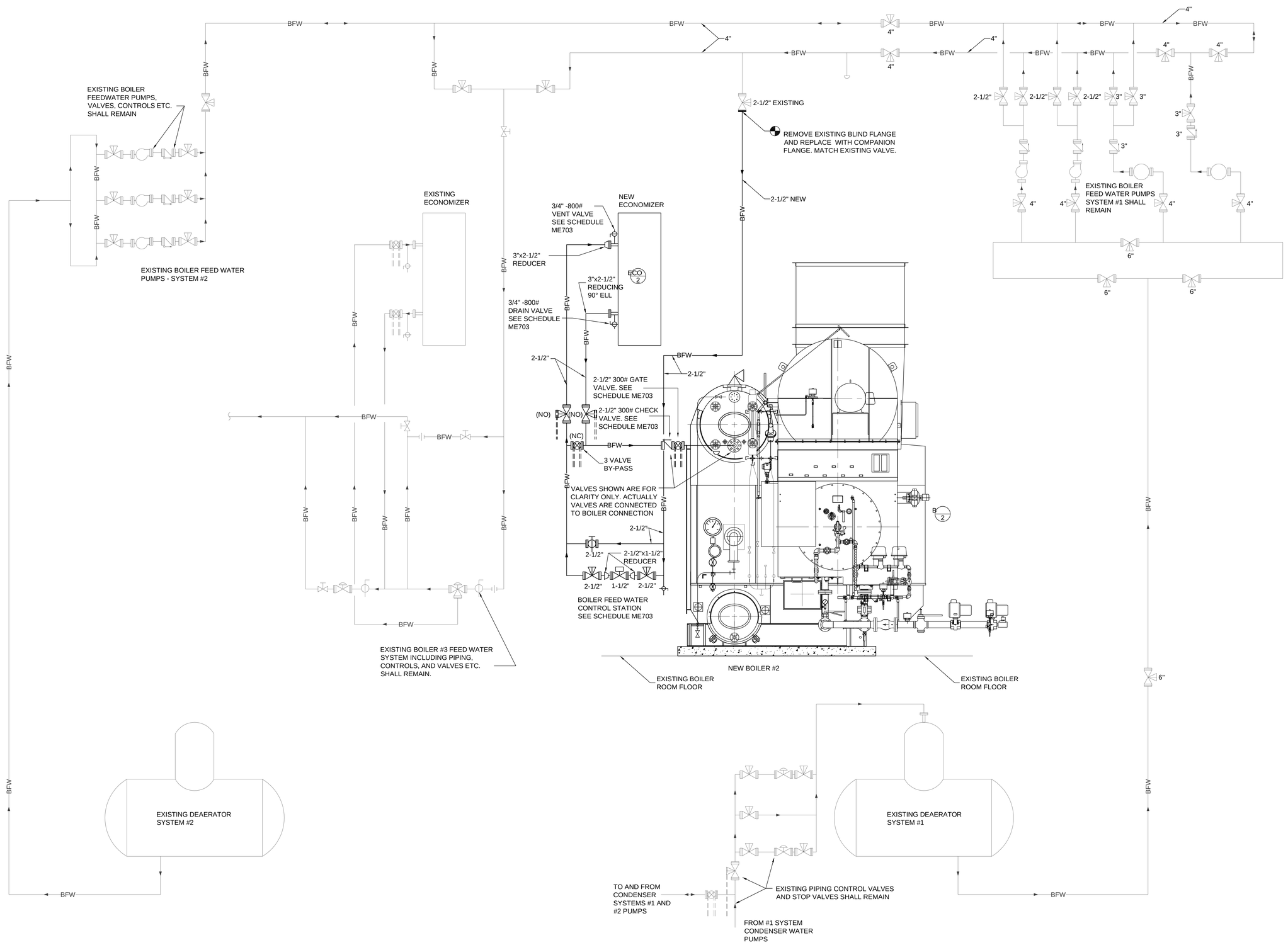
SHEET TITLE

**FUEL OIL FLOW DIAGRAM**

SHEET NO.

**ME701**




# BOILER FEEDWATER FLOW DIAGRAM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4110 State Office Building
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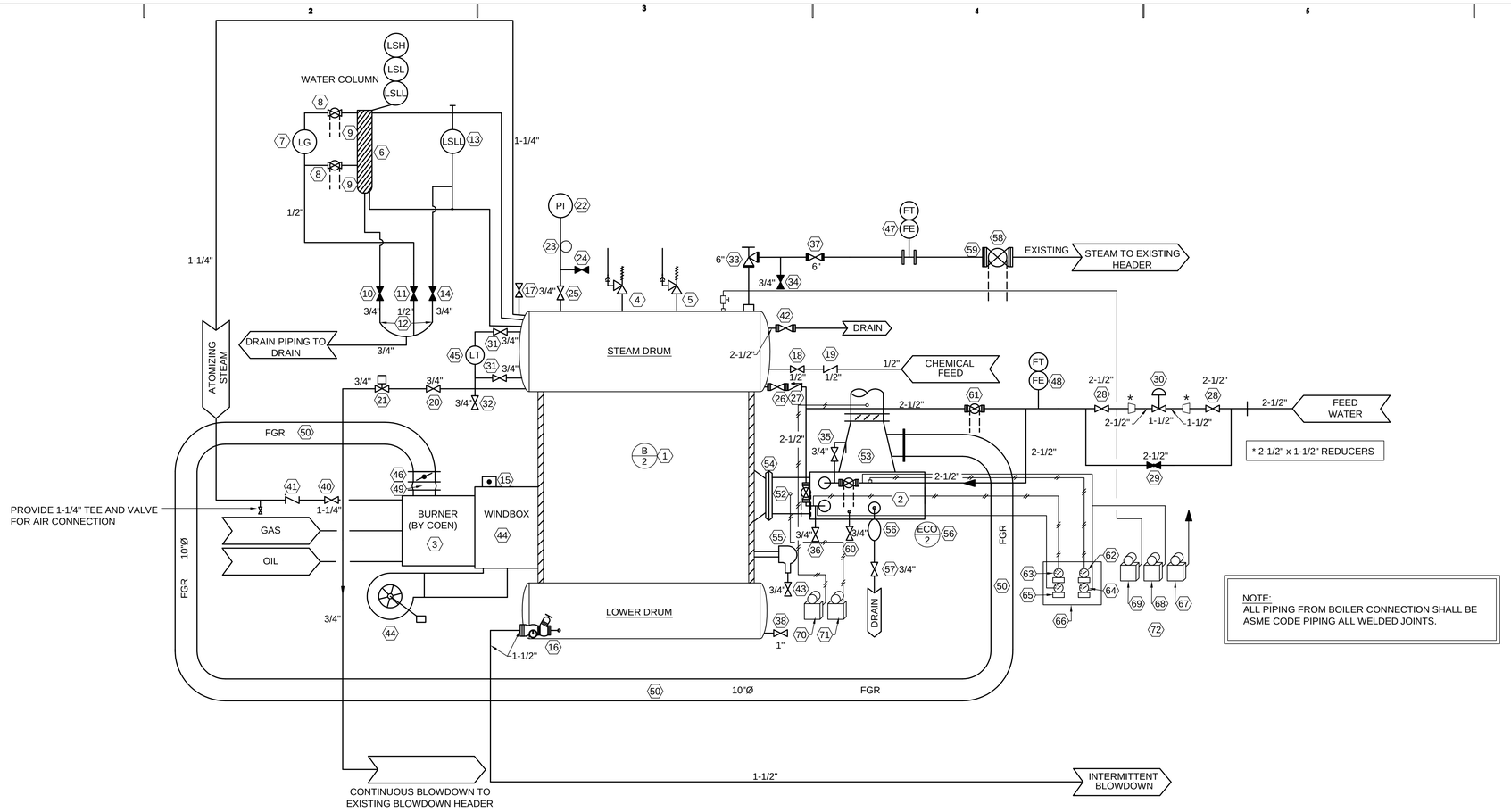
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE: BOILER FEEDWATER FLOW DIAGRAM

SHEET NO. **ME702**




* 2-1/2" x 1-1/2" REDUCERS

NOTE:
ALL PIPING FROM BOILER CONNECTION SHALL BE ASME CODE PIPING ALL WELDED JOINTS.

62 BOILER FEEDWATER INLET REMOTE TEMPERATURE GAUGE 0-300° F BY CONTRACTOR.

63 BOILER FEEDWATER OUTLET REMOTE TEMPERATURE GAUGE 0-300° F BY CONTRACTOR.

64 BOILER FEEDWATER INLET PRESSURE GAUGE 0-250 PSIG BY CONTRACTOR.

65 BOILER FEEDWATER OUTLET PRESSURE GAUGE 0-250 PSIG BY CONTRACTOR.

66 MOUNT GAUGES IN A METAL FINISHED PANEL AND SUPPORT FROM ECONOMIZER LEG SUPPORTS. PROVIDE IDENTIFICATION PLATE UNDER EACH GAUGE. BY CONTRACTOR.

67 EXISTING MAIN STEAM HEADER PRESSURE INDICATOR SHALL REMAIN. TRANSMITTER AND RECORDER WAS RELOCATED DURING DEMOLITION PHASE.

68 RELOCATED BOILER DRUM PRESSURE TRANSMITTER AND RECORDER. CONNECT TO NEW BOILER STEAM DRUM CONNECTION. ALL INSTALLATION BY CONTRACTOR.

69 RELOCATED BOILER FEEDWATER PRESSURE TRANSMITTER AND RECORDER. CONNECT TO NEW BOILER FEEDWATER CONNECTION. ALL INSTALLATION BY CONTRACTOR.

70 NEW TEMPERATURE TRANSMITTER AND RECORDER FOR FLUE GAS BOILER OUTLET AND INLET TO ECONOMIZER. BY CONTRACTOR.

71 NEW TEMPERATURE TRANSMITTER AND RECORDER FOR STACK FLUE GAS OUTLET OF ECONOMIZER. BY CONTRACTOR.

72 MOUNT RECORDERS ON STEEL PIPE SUPPORTS OR SUPPORTED FROM ECONOMIZER STRUCTURE.

## P & ID PARTS AND EQUIPMENT SCHEDULE

| # | ITEM | PROVIDED BY | INSTALLED BY | SIZE | NOTES |
|---|---|---|---|---|---|
| 1 | BOILER | STATE OF UTAH/B & W | CONTRACTOR | 30,000 #1HR | |
| 2 | ECONOMIZER | STATE OF UTAH/ECO INC. | CONTRACTOR | | SDBV |
| 3 | BURNER | STATE OF UTAH/COEN/B & W | B & W | 30,000 #1HR | |
| 4 | BOILER RELIEF VALVE | B & W | CONTRACTOR | 2-1/2" X 4" FLGD | SL |
| 5 | BOILER RELIEF VALVE | B & W | CONTRACTOR | 2" X 3" FLGD | SL |
| 6 | BOILER WATER COLUMN | B & W | B & W | | |
| 7 | BOILER GLASS GAGE | B & W | B & W | | |
| 8 | BOILER WATER GAGE VALVES | B & W | B & W | | |
| 9 | BOILER WATER COLUMN CHAIN, CHAIN PULLS & WHEELS | B & W | B & W | | |
| 10 | WATER COLUMN DRAIN VALVE | B & W | B & W | 3/4", 800 #SW | |
| 11 | WATER GAGE DRAIN VALVE | B & W | B & W | 1/2", 800 #SW | |
| 12 | DRAIN MANIFOLD | B & W | B & W | | |
| 13 | LOW WATER FUEL CUTOFF | B & W | B & W | | |
| 14 | LWCO DRAIN VALVE | B & W | B & W | 3/4", 800 #SW | |
| 15 | LWFCO BYPASS PUSHBUTTON | B & W | B & W | | |
| 16 | LOWER DRUM BLOWOFF VALVE-TANDUM VALVES | B & W | CONTRACTOR | 1-1/2", 300 #FLG | S.L. |
| 17 | DRUM VENT VALVE | B & W | CONTRACTOR | 3/4", 800 #SW | S.L. |
| 18 | CHEM, FEED ISOL. VALVE | B & W | CONTRACTOR | 1/2", 800 #SW | S.L. |
| 19 | CHEM, FEED CHECK VALVE | B & W | CONTRACTOR | 1/2", 800 #SW | S.L. |
| 20 | CONDEN. BLOW DOWN ISO. VALVE | B & W | CONTRACTOR | 3/4", 800 #SW | S.L. |
| 21 | CONDEN. BLOW DOWN CONTROL VALVE | B & W | CONTRACTOR | 3/4", 800 #SW | S.L. |
| 22 | STM. PRESSURE GAGE | B & W | B & W | | S.L. |
| 23 | STM. SYPHON | B & W | B & W | | |
| 24 | STM. GAUGE TEST VALVE | B & W | B & W | | |
| 25 | STM. GAUGE SHUT-OFF VALVE | B & W | B & W | | |
| 26 | FEED WATER STOP VALVE | B & W | CONTRACTOR | 2-1/2"-300#-FLG | S.L. |
| 27 | FEED WATER CHECK VALVE | B & W | CONTRACTOR | 2-1/2"-300#-FLG | S.L. |
| 28 | FEED WATER ISOLATION VALVES | B & W | CONTRACTOR | 2-1/2"-300# | SHIPPED AS ASSEMBLY |
| 29 | FEED WATER CONTROL BYPASS VALVE | B & W | CONTRACTOR | 2-1/2"-300# | SHIPPED AS ASSEMBLY |
| 30 | FEED WATER CONTROL VALVE | B & W | CONTRACTOR | 1-1/2"-300# | SHIPPED AS ASSEMBLY |

S.L. : SHIPPED LOOSE
SDBV : SHIPPED DIRECTLY BY VENDORS
FLG : FLANGED CONNECTION
SW : SOCKET WELD
NPL : NOMINAL PIPE THREAD

## P & ID PARTS AND EQUIPMENT SCHEDULE CONT.

| # | ITEM | PROVIDED BY | INSTALLED BY | SIZE | NOTES |
|---|---|---|---|---|---|
| 31 | DRUM LEVEL TRANS. ISOLATION VALVES | B & W | CONTRACTOR | 3/4"-800#-SW | S.L. |
| 32 | DRUM LEVEL TRANS. DRAIN VALVE | B & W | CONTRACTOR | 1/2"-800#-SW | S.L. |
| 33 | NON-RETURN ANGLE VALVE | B & W | CONTRACTOR | 6"-300#-FLG | S.L. |
| 34 | FREE BLOW DRAIN VALVE | B & W | CONTRACTOR | 3/4"-800#-SW | S.L. |
| 35 | ECONOMIZER VENT VALVE | B & W | CONTRACTOR | 3/4"-800#-SW | S.L. |
| 36 | ECONOMIZER DRAIN VALVE | B & W | CONTRACTOR | 3/4"-800#-SW | S.L. |
| 37 | STEAM STOP VALVE | B & W | CONTRACTOR | 6"-300#-FLG | S.L. |
| 38 | LOWER DRUM DRAIN VALVE | B & W | CONTRACTOR | 1"-800#-SW | S.L. |
| 39 | STEAM SAMPLE VALVE | B & W | CONTRACTOR | 1"-800#-SW | S.L. |
| 40 | ATOMIZING STEAM STOP VALVE | B & W | CONTRACTOR | 1-1/4"-800#-SW | S.L. |
| 41 | ATOMIZING STEAM CHECK VALVE | B & W | CONTRACTOR | 1-1/4"-800#-SW | S.L. |
| 42 | SOOTBLOWER ISOLATION VALVE | B & W | CONTRACTOR | 2-1/2"-300#-FLG | S.L. |
| 43 | SOOTBLOWER DRAIN VALVE | B & W | CONTRACTOR | 3/4"-800#-SW | S.L. |
| 44 | WINDBOX MTD. FD FAN W/ MOTOR & STARTER | COEN | B & W | | |
| 45 | DRUM LEVEL TRANSMITTER | B & W | CONTRACTOR | | S.L. |
| 46 | FGR DAMPER ACTUATOR | B & W | CONTRACTOR | | S.L. |
| 47 | STEAM FLOW TRANSMITTER | B & W | CONTRACTOR | | S.L. |
| 48 | FEED WATER FLOW CONTROLLER | B & W | CONTRACTOR | | S.L. |
| 49 | FGR EXPANSION JOINT | B & W | CONTRACTOR | | S.L. |
| 50 | FGR 10" DIA. DUCT | B & W | CONTRACTOR | | S.L. |
| 51 | STEAM PRESSURE TRANSMITTER | COEN | CONTRACTOR | | S.L. |
| 52 | ECONOMIZER INLET TRANSITION | ECO-INC. | CONTRACTOR | | SDBV |
| 53 | ECONOMIZER OUTLET TRANSITION | ECO-INC. | CONTRACTOR | | SDBV |
| 54 | BOILER OUTLET EXP. JOINT | ECO-INC. | CONTRACTOR | | SDBV |
| 55 | BOILER SOOTBLOWER | B & W | B & W | | |
| 56 | ECONOMIZER SOOTBLOWER | B & W | B & W | | |
| 57 | ECONOMIZER SOOTBLOWER DRAIN VALVE | CONTRACTOR | CONTRACTOR | 3/4"-800#-SW | |
| 58 | EXISTING 6"-300# GATE VALVE | N/A | N/A | | |
| 59 | REMOVE EXISTING BLIND FLANGE AND REPLACE WITH NEW 6"-300# COMPANION FLANGE | CONTRACTOR | CONTRACTOR | | |
| 60 | ECONOMIZER DRAIN AND VALVE | CONTRACTOR | CONTRACTOR | 3/4"-800#-SW | |
| 61 | FEEDWATER BYPASS AND VALVE | CONTRACTOR | CONTRACTOR | 2-1/2"-250#-FLG'D | |

S.L. : SHIPPED LOOSE
SDBV : SHIPPED DIRECTLY BY VENDORS
FLG : FLANGED CONNECTION
SW : SOCKET WELD
NPL : NOMINAL PIPE THREAD

B&W : BABCOCK & WILCOX COMPANY

NOTE:
ANY VALVES, INSTRUMENTS, FITTING OR ANY ITEM SHIPPED LOOSE SHALL BE INSTALLED BY CONTRACTOR.


State of Utah
Department of Administrative Services
DFCM
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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PROJECT MANAGER: SLW
DRAWN BY: LGD
CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

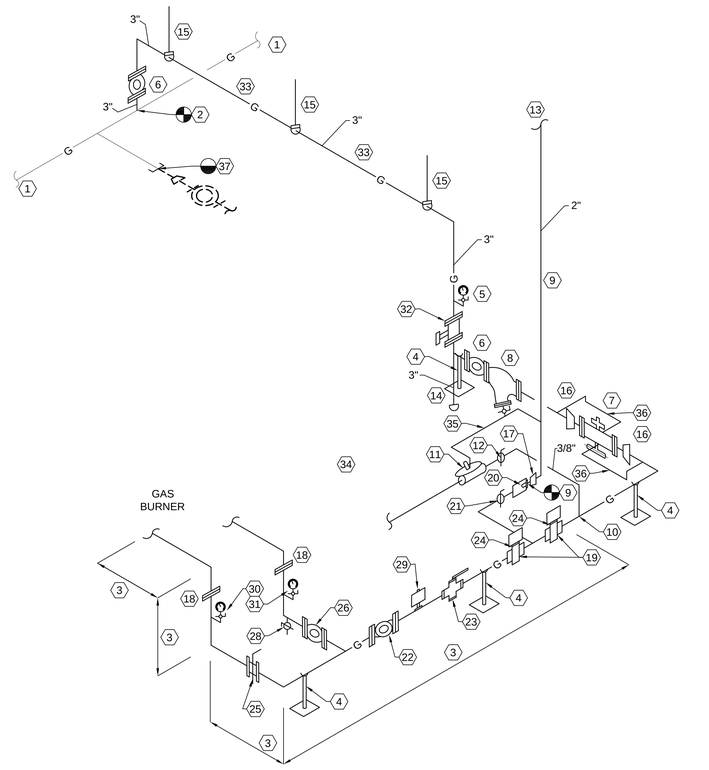
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

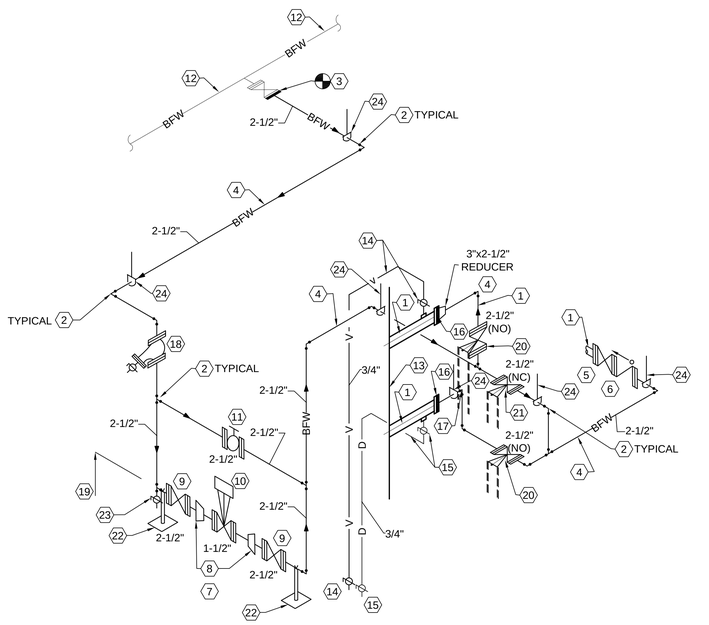
**PIPING & INSTRUMENTATION DIAGRAM**

SHEET NO.

**ME703**




C3 NEW GAS TRAIN AND PIPING ISOMETRIC
SCALE: NONE




A3 BOILER FEEDWATER PIPING ISOMETRIC
SCALE: NONE

FEEDWATER SHEET NOTES:

1. BOILER AND ECONOMIZER CONNECTIONS: ANY PIPING BETWEEN BOILER AND ECONOMIZER FIRST VALVE SHALL BE ASME CODE PIPE.
2. ALL BFW JOINTS SHALL BE WELDED AND ALL FLANGES SHALL BE 300#.
3. REMOVE BLIND FLANGE FROM EXISTING 2-1/2" GATE VALVE AND REPLACE WITH NEW COMPANION FLANGE. MATCH PRESSURE RATING OF VALVE.
4. PROVIDE NEW BFW PIPING FROM NEW COMPANION FLANGE TO ECONOMIZER AND FROM ECONOMIZER TO BOILER CONNECTION.
5. 2-1/2" - 300# FLG. BFW STOP VALVE. PROVIDED BY B&W AND INSTALLED BY CONTRACTOR.
6. 2-1/2" -300# FLG. BFW CHECK VALVE. PROVIDED BY B&W AND INSTALLED BY CONTRACTOR.
7. BFW CONTROL STATION, SHIPPED AS ASSEMBLY FROM B&W AND INSTALLED BY CONTRACTOR.
8. PROVIDE AND INSTALL 2-1/2"x1-1/2" REDUCER IF NOT PROVIDED BY B&W.
9. 2-1/2" -300# GATE VALVES PROVIDED WITH ASSEMBLY FROM B&W. INSTALLED BY CONTRACTOR.
10. 1-1/2" -300# R.F. FLG. CONTROL VALVE WITH ASSEMBLY FROM B&W. INSTALLED BY CONTRACTOR.
11. 2-1/2" -300# GLOBE VALVE. PROVIDED WITH ASSEMBLY FROM B&W. INSTALLED BY CONTRACTOR.
12. EXISTING 4" BOILER FEED WATER.
13. EDGE OF NEW ECONOMIZER.
14. 3/4" -800# S.W. GATE VALVE FOR ECONOMIZER VENT. PROVIDED BY B&W AND INSTALLED BY CONTRACTOR. PROVIDE AND EXTEND 3/4" VENT LINE DOWN SIDE OF BOILER TO DRAIN HEADER C/W 3/4" -800# S.W. BALL VALVE. PROVIDED AND INSTALLED BY CONTRACTOR.
15. 3/4" -800# S.W. GATE VALVE FOR ECONOMIZER DRAIN. PROVIDED BY B&W AND INSTALLED BY CONTRACTOR. PROVIDE AND EXTEND 3/4" DRAIN LINE DOWN SIDE OF BOILER TO DRAIN HEADER C/W 3/4" -800# S.W. GLOBE VALVE. PROVIDED AND INSTALLED BY CONTRACTOR.
16. 3" -300# COMPANION FLANGE.
17. 3"x2-1/2" REDUCING 90° ELL. PROVIDED AND INSTALLED BY CONTRACTOR.
18. 2-1/2" -300# FLG'D STRAINER WITH BLOW-DOWN VALVE. PROVIDED AND INSTALLED BY CONTRACTOR.
19. MOUNT CONTROL STATION 3'-0" FROM FLOOR TO CENTERLINE OF PIPE.
20. 2-1/2" -300# FLG'D GATE VALVE WITH CHAIN WHEEL AND CHAIN. PROVIDED AND INSTALLED BY CONTRACTOR.
21. 2-1/2" -300# FLG'D BY-PASS GATE VALVE AND PIPING WITH CHAIN WHEEL AND CHAIN. PROVIDED AND INSTALLED BY CONTRACTOR.
22. PROVIDE FLOOR SUPPORTS MADE FROM 2" DIA. PIPE WITH A 4"x4"x1/4" STEEL FLOOR PLATE BOLTED IN TWO PLACES INTO EXISTING CONCRETE FLOOR. SEE DETAIL A1/ME501.
23. 3/4" DRAIN LINE AND 3/4" - 800# SW VALVE. PROVIDED AND INSTALLED BY CONTRACTOR.
24. HANG FROM OVERHEAD STRUCTURE OR SUPPORT FROM BOILER.

GAS TRAIN SHEET NOTES:

1. EXISTING 5" GAS PIPING.
2. CONNECT TO NEW 3" GAS VALVE PROVIDED BY DEMOLITION CONTRACTOR. FIELD VERIFY EXACT LOCATION OF CONNECTION.
3. GAS TRAIN SUPPLIED BY BOILER MANUFACTURER. GAS TRAIN WILL COME BROKEN DOWN. THIS CONTRACTOR SHALL ASSEMBLE GAS TRAIN AND INSTALL ALL PARTS, VALVES ETC. AS SHOWN.
4. PROVIDE FLOOR SUPPORTS MADE FROM 2" DIA. PIPE WITH A 4"x4"x1/4" STEEL FLOOR PLATE BOLTED IN TWO PLACES INTO EXISTING CONCRETE FLOOR. SEE DETAIL A1/ME501.
5. PRESSURE GAUGE, SNUBBER, AND VALVE, IF NOT PROVIDED WITH BOILER TRAIN SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR.
6. 3" -150# FLG'D PLUG VALVE BY OTHERS.
7. 2-1/2" GAS PRESSURE REGULATOR. PROVIDED AND INSTALLED BY CONTRACTOR.
8. 3" -150# FLG'D STRAINER AND STRAINER BLOWDOWN BALL VALVE. PROVIDED AND INSTALLED BY CONTRACTOR.
9. 2" VENT THROUGH ROOF. PROVIDED AND INSTALLED BY CONTRACTOR FROM POINT SHOWN. FIELD VERIFY ROUTING OF VENT PIPING.
10. 3/8" GAS PILOT TAKE-OFF. PROVIDED AND INSTALLED BY CONTRACTOR.
11. PILOT GAS PRESSURE REGULATOR. PROVIDED AND INSTALLED BY CONTRACTOR.
12. PILOT GAS SHUT-OFF VALVE. PROVIDED AND INSTALLED BY CONTRACTOR.
13. SEE DETAIL A3/ME501 FOR PIPE ROOF PENETRATION. ALSO SEE D4/FS501.
14. PROVIDE 3" DIRT LEG.
15. PIPE HANGERS. PROVIDE 3'-0" FROM BOTH ENDS AND ONE IN CENTER. SEE DETAIL C1/ME501.
16. 3"x2-1/2" REDUCER BY CONTRACTOR.
17. 2"x1-1/4" REDUCER.
18. 3" BREAK-A-WAY FLANGES-PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
19. GAS SAFETY SHUT-OFF VALVES AND SWITCHES ASSEMBLY-PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
20. GAS VENT VALVE - 1-1/4" NPT - PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
21. GAS VENT MANUAL TEST VALVE 1-1/4" NPT - PART OF TRAIN. SEE NOTE 3 ABOVE.
22. GAS FLOW CONTROL VALVE - 3" -125# FF, FLG - PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
23. GAS MANUAL SHUT-OFF VALVE - 3" NPT. PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
24. GAS SAFETY SHUT-OFF LEAK TEST VALVES 1/4" NPT -PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
25. INNER SPUD GAS CONTROL VALVE - 3" BUTTERFLY - 125# -PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
26. OUTER SPUD GAS CONTROL VALVE -3" BUTTERFLY -125#- PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
27. GAS FLOW TRIM VALVE - 3" -125# FF FLG. - PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
28. OUTER HEADER CONDENSATE DRAIN VALVE -1/2" NPT BALL- PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
29. HIGH GAS PRESSURE SWITCH -1/4" NPT- PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
30. INNER SPUD GAS PRESSURE GAUGE -2-1/2"Ø -0-30PSI- PART OF GAS TRAIN. SEE NOTE 3 ABOVE.
31. OUTER SPUD GAS PRESSURE GAUGE -2-1/2"Ø -0-30PSI- PART OF GAS TRAIN. SEE NOTE 3 ABOVE
32. NEW GAS METER. SEE SPECIFICATIONS. METER SHALL BE SIZED TO PASS 36,864 SCFH OF NATURAL GAS AT 17 PSI.
33. GAS PIPING SHALL BE ROUTED OVER HEAD A MINIMUM OF 9'-6" FROM FLOOR TO CENTER LINE OF PIPE.
34. ALL GAS PIPING JOINTS SHALL BE WELDED EXCEPT WHERE INDICATED.
35. CONNECT VENT FROM PILOT VALVE TO NEW PIPING VENT THRU-ROOF.
36. CONNECT VENT PIPING FROM MAIN PR VALVE AND PILOT. CONNECT TO 3" GAS MAIN AS SHOWN.
37. REMOVE EXISTING 2" GAS CONNECTION TO 3" PLUG VALVE AND CAP EXISTING PIPING.


State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
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PROJECT MANAGER: SLW
DRAWN BY: LGD
CHECKED BY: SLW/WP
DATE: 04/11/08
WHW JOB NO.: 07037

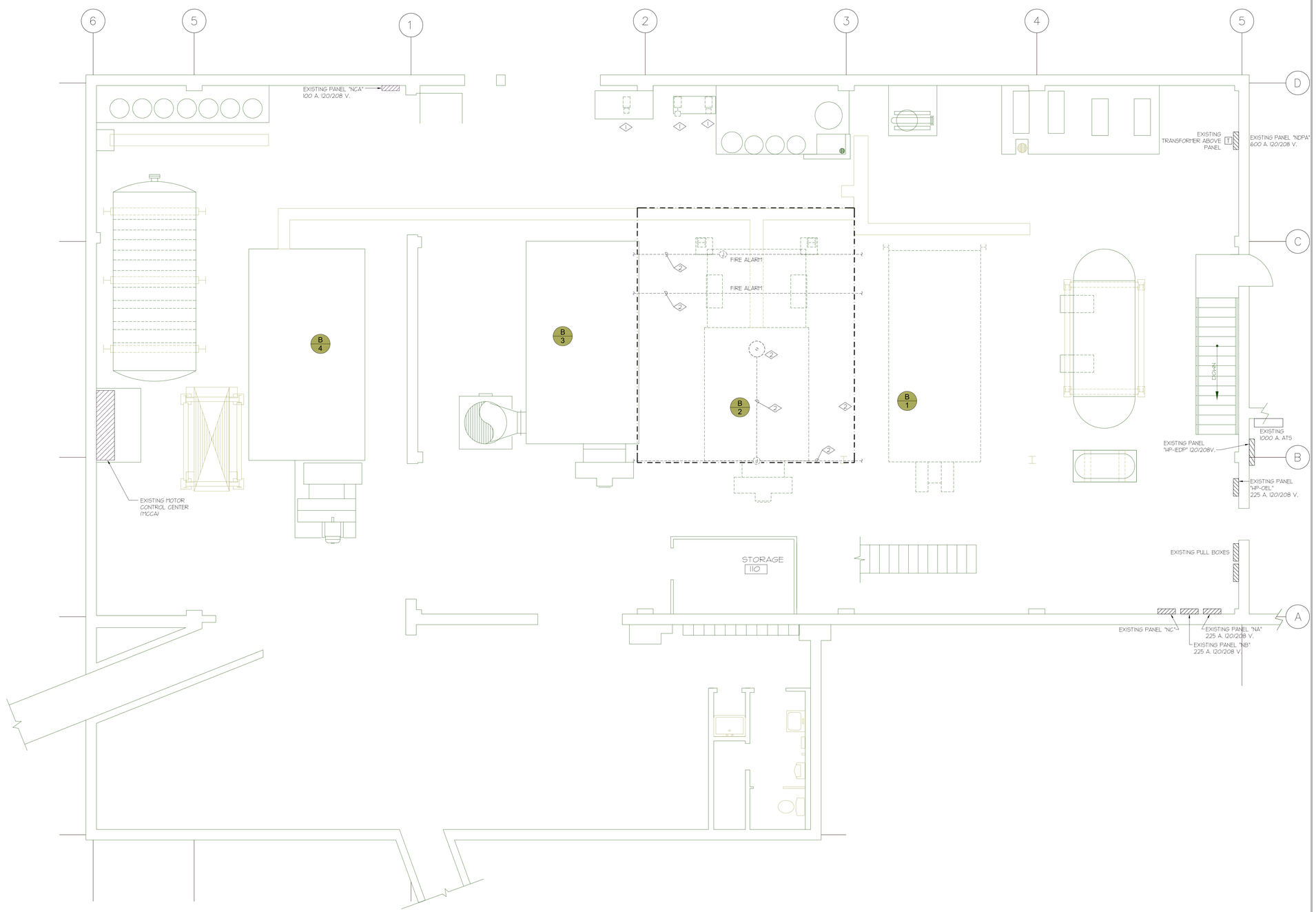
PROFESSIONAL ENGINEER 04/11/08 WINWARD M. PACKER No. 375080 STATE OF UTAH

SHEET TITLE

**PIPING ISOMETRICS**

SHEET NO.

**ME901**

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LOWER LEVEL BOILER ROOM DEMOLITION PLAN – ELECTRICAL

SCALE: 1/4" = 1'-0"

## SHEET NOTES

### REFERENCE NOTES:

<1> EXISTING OIL PUMPS ARE BEING REMOVED BY MECHANICAL CONTRACTOR. REMOVE ASSOCIATED CONDUIT, CONDUCTORS, DISCONNECTS, STARTERS, ETC. ALL THE WAY BACK TO PANELBOARD.

<2> TEMPORARILY REMOVE EXISTING FIRE ALARM CONDUIT, LIGHTING CONDUIT, LIGHT FIXTURE, CONDUCTORS, ETC. ON THE CEILING TO ALLOW THE ROOF TO BE CUT FOR NEW BOILER INSTALLATION. REPLACE ALL FIRE ALARM CONDUIT, LIGHTING CONDUIT, LIGHT FIXTURE, ETC. TO ORIGINAL LOCATIONS. MAINTAIN CIRCUIT INTEGRITY.

### GENERAL DEMOLITION NOTES:

1. UNDER DEMOLITION THE INTENT OF ELECTRICAL WORK IS TO REMOVE ALL ELECTRICAL CONDUIT, CONDUCTORS, J-BOXES, ETC. UNLESS INDICATED OTHERWISE. CONDUITS AND J-BOXES IN CONCRETE, MASONRY, AND BLOCK WALLS CAN BE LEFT IN THE WALLS AND REUSED FOR NEW DEVICES AS POSSIBLE.
2. ALL MATERIAL MUST BE REMOVED AND DISPOSED OF BY DEMOLITION CONTRACTOR, UNLESS INDICATED OTHERWISE ON DEMOLITION PLANS.
3. EXISTING DEMOLITION MATERIALS CAN NOT BE REUSED UNLESS INDICATED OTHERWISE.
4. ALL MATERIALS TO BE REMOVED FROM THE PREMISES BY THE DEMOLITION CONTRACTOR.
5. PRIOR TO SUBMITTING A BID THE DEMOLITION CONTRACTOR SHALL INSPECT THE SITE AND INCLUDED IN HIS BID PACKAGE ALL CHARGES DUE TO EXISTING CONDITIONS.
6. ANY DAMAGE DONE TO EXISTING EQUIPMENT WHICH IS TO REMAIN WILL BE DEMOLITION CONTRACTOR RESPONSIBILITY TO REPLACE THEM WITH NEW ONES.


**State of Utah**
Department of Administrative Services

DFCM
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

E.C.E. INC.
Electrical Consulting Engineers
939 So. West Temple
Salt Lake City, Utah 84101
Telephone (801) 521-8007
Telefax (801) 521-8057


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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PROJECT MANAGER: A.M.
DRAWN BY: P.B.
CHECKED BY: A.M.
DATE: 04/11/08
ECE JOB NO.: 3445

LICENSED PROFESSIONAL ENGINEER
AKBAR MATINKHAH
#172577
STATE OF UTAH

SHEET TITLE

**LOWER LEVEL BOILER ROOM DEMOLITION PLAN - ELECTRICAL**

SHEET NO.

**ED101**

## POWER SYSTEMS SYMBOL LIST

| SYMBOL | DESCRIPTION |
|---|---|
| J | JUNCTION BOX - SIZE AND FUNCTION AS REQUIRED |
| | CONDUITS CONCEALED IN FLOOR OR BELOW GRADE |
| | CONDUITS CONCEALED IN CEILING AND WALLS |
| | ARROWS INDICATE HOME RUNS |
| | FUSED DISCONNECT SWITCH - SIZE AS REQUIRED |
| S | COMBINATION STARTER/FUSED DISCONNECT SWITCH - SIZE AS REQUIRED |
| | MOTOR LOCATION |
| | ELECTRICAL PANEL LOCATION |
| VFD | VARIABLE FREQUENCY DRIVE - BY DIV. 15000 |
| XX-X | MECHANICAL EQUIPMENT CALLOUT |
| X | REFERENCE NOTE CALLOUT |

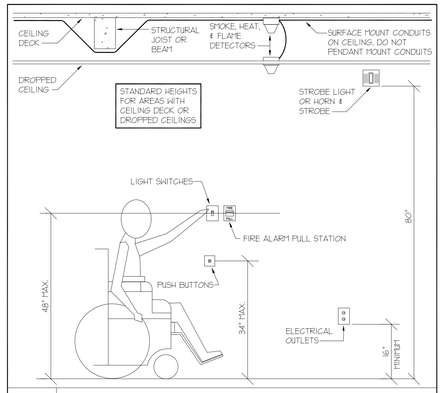
## MECHANICAL EQUIPMENT SCHEDULE

| SYMBOL | EQUIPMENT | ELECTRICAL DATA | | | | | FEEDER SIZE | | | PROTECTION & STARTING | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | DISCONNECT | | STARTING FEATURE | | |
| | | HP | KW | FLA | MCA | VOLT/PHASE | WIRE | GROUND | CONDUIT | FUSED/I FUSE | N. FUSED | START ER | VFD | |
| B-2 | BOILER | 40 | -- | 115 | -- | 208/3 | 3#1/0 | #6 | 1-1/2" | 200/150 | | | | 1 |
| B-2 | BOILER CONTROL | | -- | | | 120/1 | 2#12 | #12 | 3/4" | | | | | 2 |
| FOP-1 | ROTARY POSITIVE DISP. | 3 | -- | 10.6 | | 208/3 | 3#12 | #12 | 3/4" | 30/15 | | X | | 3 |
| FOP-2 | ROTARY POSITIVE DISP. | 3 | -- | 10.6 | | 208/3 | 3#12 | #12 | 3/4" | 30/15 | | X | | 3 |
| FOP-3 | ROTARY POSITIVE DISP. | 3 | -- | 10.6 | | 208/3 | 3#12 | #12 | 3/4" | 30/15 | | X | | 3 |

NOTES:
1. STARTER IS FURNISHED WITH THE UNIT. PROVIDE SITE DISCONNECT.
2. PROVIDE THERMAL OVERLOAD SWITCH.
3. PROVIDE STARTER IN EXISTING MOTOR CONTROL CENTER AND SITE DISCONNECT.

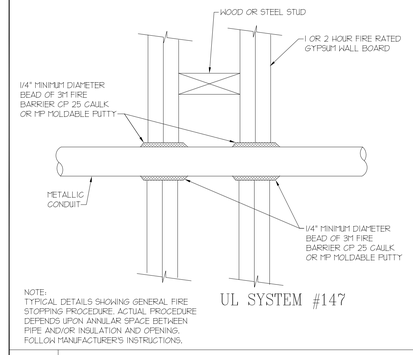
## GENERAL NOTES:

1. THE CONTRACTOR SHALL PATCH THE WALLS AND CEILINGS WHERE THE DEVICES ARE REMOVED TO MATCH THE EXISTING WALLS AND CEILINGS. COORDINATE WITH GENERAL CONTRACTOR.
2. MINIMUM SIZE OF CONDUIT TO BE 3/4". ALUMINUM CONDUITS SHALL NOT BE USED.
3. USE RIGID STEEL SET SCREW TYPE FITTINGS ONLY. DIE CAST FITTINGS SHALL NOT BE USED.
4. REFER TO THE MECHANICAL SHEETS FOR THE EXACT LOCATION OF THE MECHANICAL EQUIPMENT.
5. ALL NEW WORK MUST MEET THE CURRENT ADOPTED NATIONAL ELECTRICAL CODE.
6. NOT MORE THAN THREE (3) CIRCUITS SHALL BE INSTALLED IN A CONDUIT. EACH CIRCUIT SHALL CONSIST OF 1 CONDUCTOR FOR EACH PHASE, 1 NEUTRAL, AND 1 GROUND, FOR A TOTAL OF FIVE CONDUCTORS.
7. THE MINIMUM SIZE OF THE CONDUCTORS ARE TO BE #12 AWG THHN COPPER, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
8. ALL J-BOXES SHALL HAVE MINIMUM DEPTH OF 2-1/8" UNLESS OTHERWISE SPECIFIED. SECURE ALL J-BOXES AS SHOWN IN THE DETAILS. FURNISH AND INSTALL PROPER MUD RINGS.
9. ALL CONDUITS EXPOSED TO THE WEATHER AND IN THE BOILER ROOM SHALL BE GALVANIZED RIGID STEEL, UNLESS OTHERWISE NOTED.
10. ALL NEW EXPOSED CONDUIT MUST RUN AGAINST THE WALLS OR CEILINGS. DO NOT PENDANT MOUNT ANY CONDUIT FROM THE CEILINGS.
11. AT THE END OF THE JOB, PROVIDE BLANK COVER PLATES TO MATCH THE OTHER COVER PLATES FOR ALL J-BOXES WHERE DEVICES HAVE NOT YET BEEN INSTALLED.
12. SEAL AROUND ALL CONDUIT PENETRATIONS THROUGH FIRE RATED WALLS AND CEILINGS WITH FIRE RATED MATERIAL. 3M IS AN APPROVED MANUFACTURER.
13. ALL DISCONNECTS SHALL BE HEAVY DUTY TYPE.
14. ALL MATERIALS USED IN THIS INSTALLATION SHALL BE UL, APPROVED AND NEMA.
15. ALL ELECTRICAL WIRING MUST BE IN CONDUIT (ROMEX AND MC CABLE NOT PERMITTED).
16. FLEXIBLE CONDUITS CAN ONLY BE USED FOR SHORT RUNS (6' MAXIMUM).
17. NO CONDUITS SHALL RUN IN DUCT WORK.
18. PRIOR TO SUBMITTING A BID THE ELECTRICAL CONTRACTOR SHALL INSPECT THE SITE AND INCLUDE IN HIS BID PACKAGE ALL CHARGES DUE TO EXISTING CONDITIONS. SHOP DRAWINGS ARE REQUIRED. ALL LABOR, MATERIAL AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF 1 YEAR FROM THE DATE OF ACCEPTANCE BY THE TENANT. REPLACE OR REPAIR ALL DEFECTS DURING THE GUARANTEED PERIOD.
19. THE ELECTRICAL CONTRACTOR SHALL TERMINATE THE ELECTRICAL CONNECTIONS TO ALL THE EQUIPMENT BY PROVIDING THE NECESSARY MALE/FEMALE CONNECTOR, RECEPTACLE, PLUG, ETC.
20. ALL DUPLEX OUTLETS AND SWITCHES SHALL BE 20 AMP., 120 VOLT SPEC GRADE. HUBBELL AND PASS & SEYMOUR AND LEVITON ARE APPROVED MANUFACTURERS.
21. THE ELECTRICAL CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE MECHANICAL CONTRACTOR SO THAT NO PIPING, DUCTS, OR OTHER EQUIPMENT SHALL BE INSTALLED IN ENTRY OR PASS THROUGH ELECTRICAL ROOM OR SPACES ABOVE OR BELOW ELECTRICAL PANELS.
22. ELECTRICAL CONTRACTOR SHALL VERIFY ALL ELECTRICAL LOADS (VOLTAGE, PHASE, CONNECTION REQUIREMENT, ETC.) OF EQUIPMENT FURNISHED UNDER OTHER DIVISIONS WITH APPROVED SHOP DRAWINGS PRIOR TO BEGINNING ROUGH-IN.
23. THE CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES FOUND BETWEEN THE INTENDED FUNCTION OF EQUIPMENT AND EQUIPMENT SPECIFIED IN THE CONTRACT DOCUMENTS A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL BID. FAILURE TO REPORT ANY DISCREPANCY (CATALOG NUMBERS, DISCONTINUED ITEMS, ETC.) DOES NOT RELIEVE THE CONTRACTOR FROM PROVIDING EQUIPMENT WHICH SHALL CONFORM TO AND FULFILL THE INTENT OF THE CONTRACT DOCUMENTS. NOR SHALL IT BE USED AS A CONDITION TO OBTAIN ADDITIONAL FUNDS FROM THE OWNER AFTER THE CONTRACT IS AWARDED. THE CONTRACTOR SHALL REQUEST ALL CLARIFICATIONS OF CONTRACT DOCUMENT REQUIREMENTS IN WRITING TO THE ARCHITECT/ENGINEER A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ISSUANCE OF THE FINAL ADDENDUM.
24. PROVIDE TYPED LABEL FOR ALL DUPLEX OUTLETS AND LIGHT SWITCHES TO INDICATE WHICH CIRCUIT THEY ARE TIED TO.
25. CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE OVER SHOP DRAWINGS UNLESS SPECIFICALLY NOTED OTHERWISE.
26. TO MINIMIZE NUMBER OF FALSE FIRE ALARM DURING CONSTRUCTION, THE CONTRACTOR SHALL CAP SMOKE DETECTORS IN AREAS ADJACENT TO WORK SITE WHILE DUST-GENERATING WORK IS PERFORMED. THESE CAPS SHALL BE REMOVED AT END OF WORKDAY. COORDINATE THE EXTENT OF DEVICE CAPPING REQUIRED WITH CAMPUS FIRE MARSHALL. A LOG SHALL BE KEPT SHOWING THAT ALL CAPS ARE REMOVED AND ACCOUNTED FOR.
27. IF, FOR ANY REASON FIRE ALARM SYSTEM CANNOT BE RETURNED TO SERVICE AT THE END OF WORK DAY THE CAMPUS FIRE MARSHALL MUST BE NOTIFIED. CONTRACTOR SHALL PROVIDE FIRE WATCH AT NO ADDITIONAL COST TO THE OWNER.
28. USE NO. 10 THHN CONDUCTORS FOR CONDUCTOR LENGTH OVER 100 FEET, NO. 8 THHN OVER 200 FEET, NO. 6 THHN OVER 300 FEET AND NO. 4 THHN OVER 400 FEET LENGTH.




SCALE: N.T.S.

STANDARD HEIGHTS FOR HANDICAPPED ACCESS

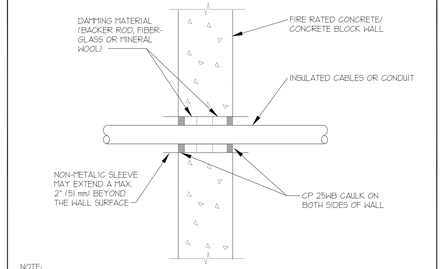



NOTE:
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

UL SYSTEM #147

SCALE: N.T.S.

FIRESTOP FOR METAL CONDUIT THROUGH GYPSUM WALL BOARD

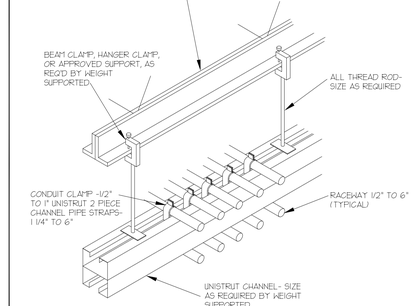



NOTE:
TYPICAL DETAILS SHOWING GENERAL FIRE STOPPING PROCEDURE. ACTUAL PROCEDURE DEPENDS UPON ANNULAR SPACE BETWEEN PIPE AND/OR INSULATION AND OPENING. FOLLOW MANUFACTURER'S INSTRUCTIONS.

UL SYSTEM #49

SCALE: N.T.S.

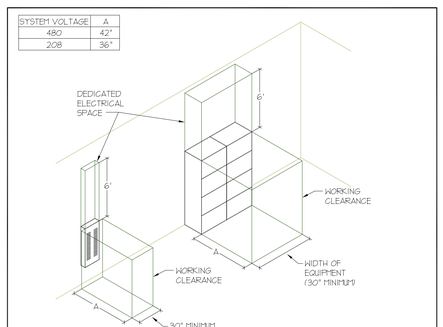
TYPICAL FIRESTOP FOR CABLES/CONDUIT THROUGH CONCRETE WALLS




SCALE: N.T.S.

TYPICAL CONDUIT RACK DETAIL

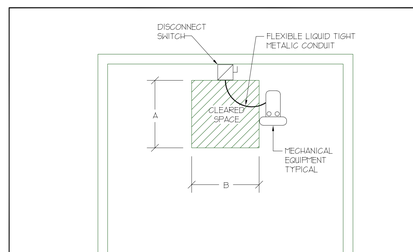
| SYSTEM VOLTAGE | A |
|---|---|
| 480 | 42" |
| 208 | 36" |




NOTE:
1. IF THE CEILING DECK IS LESS THAN 6'-0" ABOVE ELECTRICAL EQUIPMENT THEN AREA FROM EQUIPMENT TO CEILING DECK SHALL BE DEDICATED ELECTRICAL SPACE (LAY-IN DROP CEILING ARE NOT CONSIDERED AS CEILING DECK)

SCALE: N.T.S.

TYPICAL PANELBOARD CLEARANCE REQUIREMENTS




NOTE:
1. THE CONTRACTOR MUST COORDINATE EXACT LOCATION OF THE DISCONNECT WITH THE MECHANICAL CONTRACTOR TO ELIMINATE ANY OBSTACLE (PIPE, CONCRETE PAD, ETC.) IN FRONT OF THE DISCONNECT. IF THERE ARE ANY OBSTACLES, PROVIDE UNISTRUT AND INSTALL THE DISCONNECT NEXT TO MECHANICAL EQUIPMENT IN ORDER TO PROVIDE THE REQUIRED CLEARANCE.

2. PROVIDE MINIMUM CLEARANCE AS FOLLOWS:

| SYSTEM VOLTAGE | A | B |
|---|---|---|
| 480 | 42" | 30" |
| 208 | 36" | 30" |

SCALE: N.T.S.

TYPICAL DISCONNECT CLEARANCE REQUIREMENTS


State of Utah
Department of Administrative Services
Division of Facilities Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267
Internet: http://www.dfcm.state.ut.us

CONSULTANTS

WHW ENGINEERING INC.
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

E.C.E. INC.
Electrical Consulting Engineers
939 So. West Temple
Salt Lake City, Utah 84101
Telephone (801) 521-8007
Telefax (801) 521-8057


PROJECT NAME & ADDRESS

**WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT**

**DFCM No. 07049810**

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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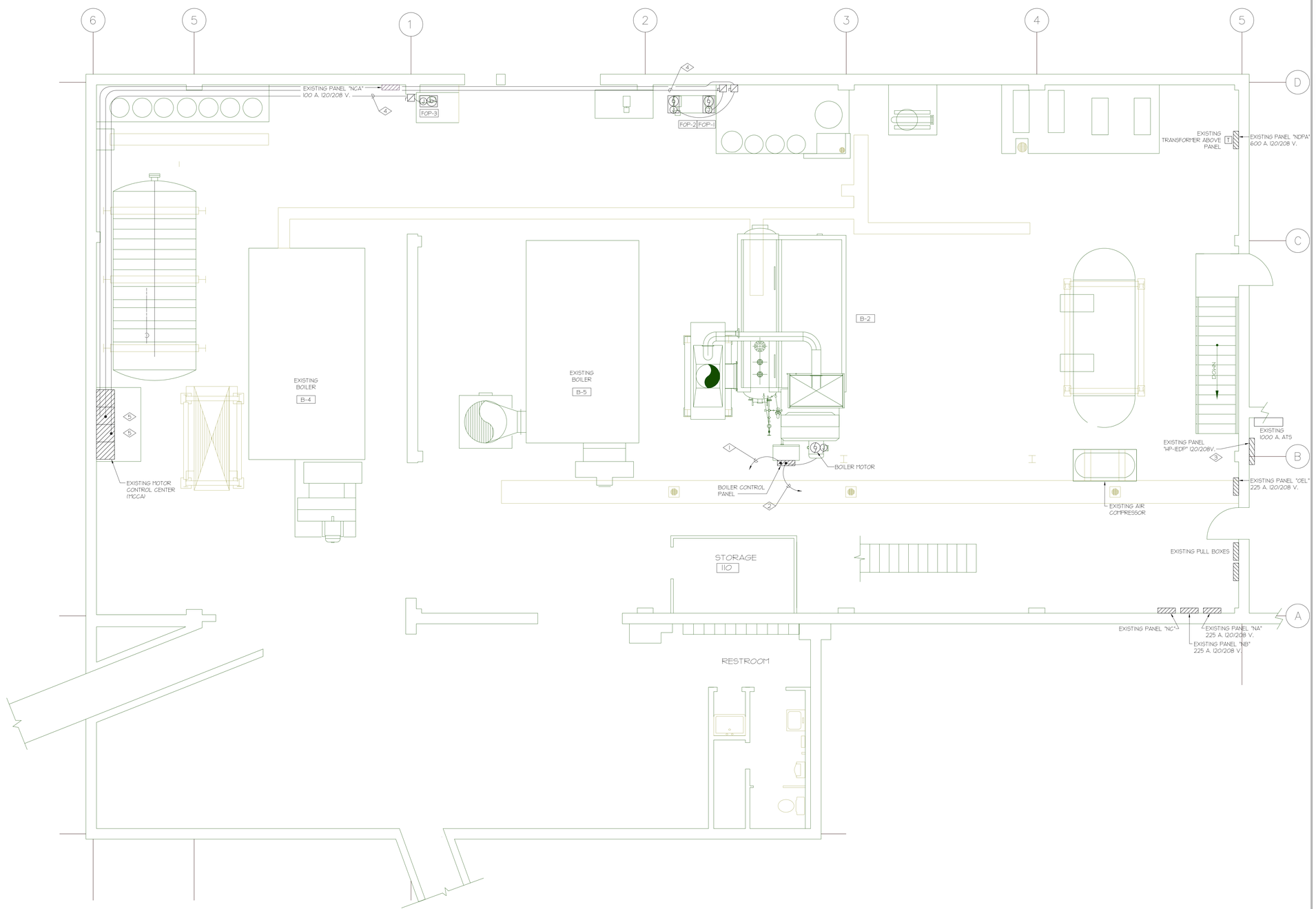
PROJECT MANAGER: A.M.
DRAWN BY: P.B.
CHECKED BY: A.M.
DATE: 04/11/08
ECE JOB NO.: 3445

LICENSED PROFESSIONAL ENGINEER
AKBAR MATINKHAH
#172577
STATE OF UTAH

SHEET TITLE
**GENERAL NOTES, SCHEDULES AND DETAILS**

SHEET NO.
**EE001**

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LOWER LEVEL BOILER ROOM PLAN – ELECTRICAL

SCALE: 1/4" = 1'-0"

## SHEET NOTES

### REFERENCE NOTES:

1. TIE THE BOILER CONTROL PANEL TO A 20 AMP, SPARE CIRCUIT BREAKER IN PANEL "OEL". PROVIDE CONDUIT AND CONDUCTORS FOR A COMPLETE INSTALLATION.
2. TIE THE BOILER MOTOR TO A NEW 150 AMP, 3 POLE CIRCUIT BREAKER EXISTING PANEL "IEDP" THROUGH THE BOILER CONTROL PANEL. PROVIDE CONDUIT AND CONDUCTORS FOR A COMPLETE INSTALLATION. COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT POINT OF CONNECTION.
3. FURNISH AND INSTALL A 150 AMP, 3 POLE CIRCUIT BREAKER IN EXISTING SQUARE-D I-LINE PANEL. NEW CIRCUIT BREAKER MUST HAVE THE SAME AIC RATING AS EXISTING CIRCUIT BREAKERS. UTILIZE THIS CIRCUIT BREAKER FOR NEW BOILER.
4. TIE THE NEW PUMP TO A NEW STARTER IN EXISTING MOTOR CONTROL CENTER THROUGH THE SITE DISCONNECT. PROVIDE CONDUIT AND CONDUCTORS FOR A COMPLETE INSTALLATION.
5. FURNISH AND INSTALL TWO (2) NEW STARTERS AND UTILIZE ONE EXISTING STARTER FOR NEW PUMPS. PROVIDE ALL NECESSARY FUSES, PARTS, ETC. FOR A COMPLETE INSTALLATION. NEW STARTERS TO BE THE SAME BRAND AND TYPE AS EXISTING WITH TWO NORMALLY OPEN AND TWO NORMALLY CLOSED CONTACTS. FIELD VERIFY.

### SPECIAL NOTES:

1. COLOR OF ALL NEW CONDUIT COUPLINGS, BOXES, ETC. FOR 120/208 VOLT SYSTEM SHALL BE YELLOW TO MATCH COLOR OF EXISTING CONDUIT.


**State of Utah**
Department of Administrative Services

Division of Facilities
Construction & Management
4110 State Office Building
Salt Lake City, Utah 84114
Phone: (801) 538 - 3018
Fax: (801) 538 - 3267

Internet: http://www.dfcm.state.ut.us


CONSULTANTS


**WHW ENGINEERING INC.**
PROFESSIONAL MECHANICAL ENGINEERING
8619 Sandy Parkway Suite 101
SANDY, UTAH 84070
(801)466-4021, FAX 466-8536
EMAIL: excellence@whw-engineering.com

E.C.E. INC.
Electrical Consulting Engineers
939 So. West Temple
Salt Lake City, Utah 84101
Telephone (801) 521-8007
Telefax (801) 521-8057


PROJECT NAME & ADDRESS

# WEBER STATE UNIVERSITY HEATING PLANT - BOILER REPLACEMENT

## DFCM No. 07049810

Ogden, Utah

| MARK | DATE | REVISION |
|---|---|---|
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PROJECT MANAGER: A.M.
DRAWN BY: P.B.
CHECKED BY: A.M.
DATE: 04/11/08
ECE JOB NO.: 3445

LICENSED PROFESSIONAL ENGINEER
AKBAR MATINKHAH
#172577
STATE OF UTAH

SHEET TITLE

**LOWER LEVEL BOILER ROOM PLAN - ELECTRICAL**

SHEET NO.

# EE101